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WILDLIFE REVIEW

AN ABSTRACTING SERVICE FOR WILDLIFE MANAGEMENT
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BY THE
BUREAU OF BIOLOGICAL SURVEY
UNITED STATES DEPARTMENT OF THE INTERIOR

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WILSON ORNITHOLOGICAL CLUB

Chicago, Ill. No. 37 June, 1943

Bibliography: Rabbit diseases

Herman, Carlton M. The rabbit as used in disease research. A selected bibliography including the spontaneous diseases of rabbits, U. S. Fish and Wildlife Service (Chicago, Ill.), v+519 pp. (mimeographed), 1942 (1943).

Prepared in an edition of 250 copies, distribution of this work will be restricted to those especially interested in its subject matter. The work includes 4,859 titles which are presented in a classified manner; and also a list of publication abbreviations, and both subject and author indexes.

Classification: Ophidia, Agkistrodon

Gloyd, Howard K., and Roger Conant. A synopsis of the American forms of Agkistrodon (copperheads and moccasins), Bul. Chicago Acad. Sci. (Chicago, Ill.), 7(2), Feb. 1943, pp. 147-170, 16 figs., 2 maps, 1 table.

Key to the species and subspecies (2 + 4 occurring in the United States); with synonymy, type locality, range, diagnosis, and illustrations of each. Two-page bibliography.

Classification: Ophidia, Diadophis

Blanchard, Frank N. The ring-neck snakes, genus Diadophis, Bul. Chicago Acad.Sci. (Chicago, Ill.), 7(1), 1942, 144 pp., 26 figs., 17 tables.

Characteristics of the genus; key to 15 species and subspecies, most of which occur in the United States. For each form technical and vernacular names and scientific synonymy are presented as well as a diagnosis, description, statement of habitat and range, and discussion of variation and affinities. There is a general discussion of relationships and a 9-1/2 page bibliography.

Classification: Siphonaptera

Ewing, H. E., and Irving Fox. The fleas of North America, U. S. Dept. of Agriculture Misc. Publ. 500 (Supt. of Documents, Washington, D.C. 20 cents a copy), 142 pp., 13 figs., 1943.

Fleas, carriers of plague and typhus, are objectionable also as causing irritation and loss of blood to various hosts. This paper discusses and illustrates the characters used in the classification of fleas and the relationships of the order. Keys to families, subfamilies, and genera are presented. The species are catalogued, and their synonymy, hosts, and range recorded. Remarks upon diagnostic characters are made in many cases. There is a bibliography of 91 titles and an index.

Control: Bounty on the red fox

Pradt, G. W. The fox bounty question again, Michigan Conservation (Michigan Dept. of Conservation, Lansing), 12(3), April 1943, pp. 4-5, 1 photo.

Michigan has had experience (more than a million dollars worth) and its own conclusions, as well as those quoted for Pennsylvania and Ontario, point to the inadvisability of perpetuating the bounty system. The author shows that foxes are not so destructive as popularly believed and that they have positive values of their own. He shows that the abundance of predators depends upon that of their prey and not the contrary. "Bounties cost a lot of money," he says, "and produce no demonstrable effects on either the bountied predators or their natural prey."

Control: Coyote-getter

Robinson, Weldon B. The "Humane Coyote-getter" vs. the steel trap in control of predatory animals, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(2), April 1943, pp. 179-189, 5 figs., 7 tables.

The coyote-getter is a device for discharging (by means of a .38 caliber cartridge) a lethal quantity of sodium cyanide into the mouth of an animal tugging at the exposed furry end to which a fetid scent has been applied. The investigations here reported upon were undertaken to learn the merits and demerits in predator control of the coyote-getter as compared to the steel trap. The new device was ineffective for bobcats but for coyotes and other predators was about 10 percent better. It was particularly valuable when frozen ground impeded the action of traps; much more selective than traps for the capture of coyotes; and less destructive to small mammals, birds, deer, antelopes, and domestic sheep, but more dangerous to dogs, bears, and cattle. It seems too destructive to livestock for general use in a cattle country. Of the creatures killed by the coyote-getter and recovered, about 95 percent were predators. The killing action is very rapid and the device is more economical to use than is the steel trap. It needs improvement and for the present is considered as an adjunct to, but not a substitute for, the steel trap.

Control: Crop damage

Einarsen, Arthur S. Suggestions for reducing crop damage by wildlife, Oregon Agr. Expt. Station (Corvallis), Circ. 148, April 1943, 8 pp., 4 figs.

Discussion of damage by the ring-necked pheasant and the Douglas ground squirrel and suggestions for controlling it.

Control: Seed-spot protection

Keyes, Joseph, and Clarence F. Smith. Pine seed-spot protection with screens in California, Journ. Forestry (Mills Bldg., Washington, D.C. 50 cents a copy), 41(4), April 1943, pp. 259-264, 3 figs., 3 tables.

The paper in mimeographed form noted in WILDLIFE REVIEW, No. 35, November 1942, p. 7, enlarged, printed, and illustrated. Domes made of hardware cloth were used at a cost under experimental conditions of about 6-1/2 cents per seed spot, or $3.87 per acre. The efficiency of protection is very high, losses occurring only through action of the elements, trampling by cattle, and to a small extent through forcible entry by rodents. Rapidly germinating seed should be used to reduce time of exposure. There is some evidence that the domes improve conditions for germination through conservation of light and heat. Bibliography of 6 titles.

Control: Of rat

Eskey, C. R. Murine typhus fever control, U. S. Public Health Reports (Supt. of Documents, Washington, D. C. 5 cents a copy), 58(16), April 16, 1943, pp. 631-638, 1 table.

Murine typhus fever was reported in about 20,000 humans from 1932 to 1941 and in 3,700 in 1942. The actual number of cases was probably much larger. Most infections are traceable to domestic rats. Control of the disease rests upon eradication of its rodent reservoirs--a difficult task. Methods are discussed and recommendations made for community activities in rat control.

An accompanying article (pp. 638-639) outlines the work of the "Typhus fever control unit of the United States Public Health Service."

Control: Of tick

Mail, G. Allen. Tick control with special reference to Dermacentor andersoni Stiles, Sci. Agr. (Canadian Society of Technical Agriculturists, Ottawa, Canada. 75 cents a copy), 23(1), Sept. 1942, pp. 59-67.

Tick paralysis of man and animals, for which no adequate control is known, is common in British Columbia. Arsenical dips are the best means of ridding stock of ticks. There is need for a repellent that is effective for at least two weeks, although repellents in the form of dusts are not practical for range herds. Sheep should be kept off infected pastures; they are of no value as tick traps as the lanolin of sheep wool is not toxic to ticks. Tick parasites are not promising as controls against D. andersoni in the dry British Columbia interior. Bibliography of 24 titles.--Lee E. Yeager.

Cycles: Rabbit

McCabe, Robert A. Population trends in Wisconsin cottontails, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 24(1), Feb. 1943, pp. 18-22, 2 figs., 1 table.

Report on a widespread study by flushing rates as reported by hunters. The results indicate a cyclic trend that characterizes rabbit populations also in Canada, Pennsylvania, and California. Bibliography of 5 titles.

Destruction: Extirpations

Schorger, A. W. Extinct and endangered mammals and birds of the upper Great Lakes region, Trans. Wisconsin Acad. Sciences, Arts, and Letters (Loyal Durand, Jr., 318 Science Hall, Madison, Wisc.), 34, 1942, pp. 23-44.

Interesting historical treatment (including 122 citations to literature) for 9 species of mammals and 5 of birds. All but one of the losses, that of the passenger pigeon, fortunately can as yet be classed as local extirpations, not general extinctions.

Destruction: Winter Killing

Allen, Durward L. Relationships of winter weather to farmland wildlife in the Midwest, Reprinted from Proceedings Central Snow Conference, Vol. 1, 1941 (Rose Lake Wildlife Expt. Station, East Lansing, Mich.), 8 pp., 2 figs. (processed), 1942.

Author's conclusions: "An examination of the literature on winter weather in relation to wildlife indicates that deep snow or ice vitally affects many animals. Their most important effect is to cut off the food supply of groundfeeding species like granivorous birds, and mice, squirrels which have their food buried in the ground, and rabbits which feed upon herbaceous plants. Under these conditions migrant birds may move to other regions. Quail tend to weaken rapidly and often die from starvation and exposure. Pheasants are hardy and adaptable and succumb only to extreme conditions. Squirrels may die if they are not fat and in good condition. Rabbits modify their use of cover and their feeding habits. Severe storms involving low temperatures are sometimes destructive to many kinds of birdlife. Healthy songbirds, quail, and pheasants may be killed by high winds and wind-driven snow. Birds may be drifted over and imprisoned with fatal results. Rabbits, mice, and other animals are sometimes killed by exceptionally severe winter storms. It is common for the first cold or stormy period of the winter to eliminate subnormal individuals of many species.

"The lethal effects of winter weather are most evident on the northern limit of distribution of some species. In some, like the quail, hard winters appear to be the direct limiting factor which demarks the range boundary. In others climate operates indirectly through its effect on plant growth. Most animals within their accustomed ranges are adapted to withstanding all but the most exceptional winter conditions. For farm-game in Michigan winter is not the seasonal bottleneck which determines high or low populations. The status of pheasants and rabbits in most areas is determined largely by conditions affecting the production and survival of young in summer."

Bibliography of 30 titles.

Diseases and Parasites: Botulism

Duffield, Leland, and Harold Butler. Non-toxicity of Clostridium botulinum Type C, Wasmann Collector (University of San Francisco, Calif.), 4(3), April 1941, p. 109.

Bacteria isolated from the livers of ducks which had died from botulism lost their toxicity in cultures.

Diseases and Parasites: Botulism

Quortrup, E. R., and R. L. Sudheimer. Research notes on botulism in western marsh areas with recommendations for control, Trans. Seventh N. A. Wildlife Conference 1942 (American Wildlife Institute, Investment Bldg., Washington, D. C. $1.00 a copy), pp. 284-293, tables.

Investigation as to whether selenium poisoning might account for some of the cases reported as botulism gave negative results; the experiments made and the contrasting symptoms are described. Similarly toxic algae and encephalomyelitis were discounted as factors in western duck sickness. Lesions do not certainly identify botulism but symptoms do; they are described. Antitoxin reveals the presence of the botulinus toxin and the producing organism can be demonstrated by cultural methods. Field indicators that might make it possible to predict the danger of an outbreak of botulism were investigated. Low oxygen and a pH of about 8 are favoring factors. Preformed toxin apparently does not last long in the wild except when frozen. Production of toxin under cultural conditions is discussed; the maximum amount was produced after 7 days' incubation at 37° C. Botulinus toxin can be produced by bacteria growing on a variety of animal matter, on various plants, and even in soil rich in organic matter. Environmental changes resulting in the death of animals and of plants about marginal lake or marsh areas with subsequent reflooding provide conditions suitable for the growth of Clostridium botulinum. Temporary and permanent corrective measures are discussed. Bibliography of 10 titles.

Diseases and Parasites: Botulism

Quortrup, E. R., and R. L. Sudheimer. Detection of botulinus toxin in the blood stream of wild ducks, Journ. Amer. Veterinary Med. Assoc. (600 S. Michigan Ave., Chicago, Ill. 75 cents a copy), 102(793), April 1943, pp. 264-266, 1 photo, 2 tables.

By peritoneal inoculation of mice with serum from centrifuged duck blood; the toxin could be demonstrated in the blood of ducks fed toxic material in as short a period as 5 minutes, and as late as 68 hours, after ingestion.

Diseases and Parasites: Coccidiodomycosis

Ashburn, L. L., and C. W. Emmons. Spontaneous coccidioidal granuloma in the lungs of wild rodents, Archives of Pathology (American Medical Association, 535 N. Dearborn St., Chicago, Ill. 75 cents a copy), 34(5), Nov. 1942, pp. 791-800, 3 pls.

Of 105 rodents trapped near San Carlos, Arizona, 7 pocket mice, 1 kangaroo rat, and 1 ground squirrel showed lesions of this disease, which are described and figured.

Diseases and Parasites: Encephalomyelitis

Gwatkin, Ronald, and Irvin W. Moynihan. Search for sources and carriers of equine encephalomyelitis virus, Canadian Journ. Research (National Research Council of Canada, Ottawa. 50 cents a copy), Vol. 20, Sect. D, No. 11, Nov. 1942, pp. 321-337.

Of a considerable number of ground squirrels, jack rabbits, hawks, pheasants, crows, and wild ducks collected in Alberta, only two ground squirrels gave any evidence suggestive of the presence of the virus.

Diseases and Parasites: Hemorrhagic septicemia

Quortrup, E. R. Hemorrhagic septicemia in mule deer, North American Veterinarian (Box 550, Evanston, Ill. 50 cents a copy), 23(1), Jan. 1942, pp. 34-36, 2 photos.

Apparently about half of the deer on the Stansbury Range, Tooele County, Utah, had perished in the summer of 1940. In two days in September, 59 carcasses were found upon four of the freshest of which post mortems were made. Lesions and the results of biological analysis of sample tissues are described. Pure cultures of Pasteurella boviseptica were obtained.

Diseases and Parasites: Lungworms of porpoises

Dougherty, Ellsworth C. Notes on the lungworms of porpoises and their occurrence on the California coast, Proc. Helminthological Society Washington (Edna M. Buhrer, U. S. Horticultural Station, Beltsville, Md. 50 cents a copy), 10(1), Jan. 1943, pp. 16-22.

Survey of the occurrence and nomenclature of these parasites; check-list of 5 genera and 15 species; bibliography of 33 titles.

Diseases and Parasites: Nutritional deficiency

Nestler, Ralph B., and Woodrow W. Bailey. Vitamin a deficiency in bobwhite quail, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(2), April 1943, pp. 170-173, 1 pl., 2 tables.

Report on experiments designed to clarify the symptoms of Vitamin A deficiency in bobwhites. The feeds administered are described and their effects on growth and appearance of living birds and on the organs of autopsied specimens are discussed and illustrated.

Diseases and Parasites: Paratyphoid

Cunningham, Charles H. Paratyphoid infection in quail, Amer. Journ. Veterinary Research (600 S. Michigan Ave., Chicago, Ill. $1.25 a copy), 4(11), April 1943, pp. 190-193, 2 tables.

Review of literature (13 titles cited) and report upon an outbreak of the disease at a commercial game-bird hatchery, presumably in Maryland. Symptoms, lesions, and methods of identification are described. The causative organism was Salmonella bredeney. The mortality exceeded 38 percent.

Diseases and Parasites: Plague

Anon. Plague infection reported in the United States during 1942, U. S. Public Health Reports (Supt. of Documents, Washington, D. C. 5 cents a copy), 58(16), April 16, 1943, pp. 640-645, table.

Only one case of plague in a human was reported in 1942 (in Siskiyou County, California). The results of investigations of rodents and their ectoparasites in that year are tabulated and summarized. Plague infection was found in most of the groups of common rodents and from specimens collected in 6 western states.

The next article (p. 646) relates to "Positive plague and tularemia specimens reported in Canada during 1942."

Diseases and Parasites: Plague

Evans, F. C., C. M. Wheeler, and J. R. Douglas. Sylvatic plague studies. III. An epizootic of plague among ground squirrels (Citellus beecheyi) in Kern County, California, Journ. Infectious Diseases (University of Chicago Press, 5750 Ellis Ave., Chicago, Ill. $2.00 a copy), 72(1), Feb. 1943, pp. 68-76, 1 fig., 5 tables.

Review of the occurrence of plague epizootics among rodents of the world (10 bibliographical references) and report on the status of the disease in Beechey's ground squirrel in Kern County, California. Plague was first proved to exist there in 1934 and has been the subject of annual surveys since that time; in 1941 it assumed epizootic proportions. The malady exhibited different cycles locally and was at its height at the period young squirrels were emerging and dispersing. When they became sedentary the outbreak was checked. The infection was found in fleas both before and after the epizootic; the fleas identified are named and their incidences of infection recorded.

Diseases and Parasites: Plague

Prince, Frank M. Species of fleas on rats collected in states west of the 102d meridian and their relation to the dissemination of plague, U. S. Public Health Reports (Supt. of Documents, Washington, D. C. 5 cents a copy), 58(18), April 30, 1943, pp. 700-708, tables.

Combined list of 21 species of fleas; also records of those identified from each state. The rats involved (Rattus norvegicus, R. rattus, and R. alexandrinus) are all highly susceptible to infection with plague and under experimental conditions, 9 of the species of fleas have been found capable of transmitting plague. This disease is known among wild rodents in 12 western states and if it should become prevalent among the domestic rats, the way would be prepared for possibly serious outbreaks of human plague. Bibliography of 8 titles.

Diseases and Parasites: Toxoplasmosis

Perrin, Theodore L., George D. Brigham, and Edgar G. Pickens. Toxoplasmosis in wild rats, Journ. Infectious Diseases (University of Chicago Press, 5750 Ellis Ave., Chicago, Ill. $2.00 a copy), 72(1), Feb. 1943, pp. 91-96, 1 pl., 1 table.

Description and illustration of lesions in laboratory cavies and in wild rats from Savannah, Georgia. References to the occurrence of toxoplasmosis in domestic animals and birds. This disease also affects man.

Diseases and Parasites: Typhus fever

Brigham, George D., and Edgar G. Pickens. A strain of endemic typhus fever virus isolated from house mice (Mus musculus musculus), U. S. Public Health Reports (Supt. of Documents, Washington, D. C. 5 cents a copy), 58(4), Jan. 22, 1943, pp. 135-136.

House mice and rats from Savannah, Georgia, were found infected with endemic typhus virus. Bibliography of 6 titles.

Diseases and Parasites: Acanthocephala

Van Cleave, Harley J. A reconsideration of Plagiorhynchus formosus and observations on Acanthocephala with atypical lemnisci, Trans. Amer. Microscopical Soc. (James E. Ackert, Kansas State College, Manhattan, Kans.), 61(2), April 1942, pp. 206-210.

Discussion of relationships and synonymy with incidental mention of several hosts, all passerine birds.

Diseases and Parasites: Acanthocephala, Corynosoma

Lincicome, David R. Acanthocephala of the genus Corynosoma from the California sea-lion, Journ. Parasitology (Lancaster, Pa.), 29(2), April 1943, pp. 102-106, 1 pl., tables.

Descriptions, measurements, and illustrations of two species, one of which, C. obtuscens, is characterized as new. Comparative notes; bibliography of 10 titles.

Diseases and Parasites: Acarina of Iowa

Eddy, Gaines W., and Chas. R. Joyce. Ticks collected on the Tama (Iowa) Indian Reservation with notes on other species, Iowa State College Journal of Science (Iowa State College Press, Ames. $1.00 a copy), 16(4), July 1942, pp. 539-543.

Thirteen species; incidental mention of mammal and bird hosts. Bibliography of 12 titles.

Diseases and Parasites: Acarina, Ornithodoros

Wheeler, Charles M. A contribution to the biology of Ornithodoros hermsi Wheeler, Herms and Meyer, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 29(1), Feb. 1943, pp. 33-41, 2 figs., 3 tables.

This tick is a parasite of small mammals especially the chipmunks (Eutamias) in mountainous regions of the Western United States. Notes are given on field biology and on laboratory studies of its life history. Longevity up to 6-1/2 years; females withstood starvation more than 4 years. Bibliography of 15 titles.

Diseases and Parasites: Bacteria, Corynebacterium

Steinhaus, Edward A. A new bacterium, Corynebacterium lipoptenae, associated with the louse fly, Lipoptena depressa Say, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 29(1), Feb. 1943, p. 80.

From flies on deer near Hamilton, Montana; incidence, 100%. Description; cultural manifestations.

Diseases and Parasites: Bacteria, Salmonella

Leslie, P. H. The bacteriological classification of the principal cultures used in rat and mouse control in Great Britain, Journ. Hygiene (Cambridge University Press, 200 Euston Road, London, N.W. 1, England. 15 shillings a copy), 42(5), Oct. 1942, pp. 552-562, 3 tables.

The term "virus" used in trade for these bacterial preparations is retained as a convention by the author, who calls attention to the fact that they are not viruses in present-day technical nomenclature. Author's summary: "(1) The six 'viruses', Liverpool, Danysz, London, Ready Rat Relief, Institut Pasteur and Ratin, which are the principal bacterial cultures at present employed for anti-rodent control in Great Britain, have been examined; (2) by means of reciprocal absorption tests all these six strains were found to be serologically identical with S. enteritidis Gaertner, antigenic structure, IX:gom:—; (3) from the results of the fermentation tests, which may be used to subdivide this serological type, Liverpool, Danysz, Ready Rat Relief and Ratin were assigned to the var. danysz subgroup; while the London and Institut Pasteur strains could not be distinguished from the classic S. enteritidis

type; (4) both of these subgroups are pathogenic for man, and evidence is cited which shows quite clearly that human cases of gastro-enteritis have been caused by the use of virus preparations. There are, also, reasonable grounds for believing that these bacterial types may be pathogenic for a number of domestic animals, including some poultry." Literature cited: 26 references.

Diseases and Parasites: Blood parasites

Thompson, Paul E. The relative incidence of blood parasites in some birds from Georgia, Journ. Parasitology (Science Press, Lancaster, Pa.), 29(2), April 1943, pp. 153-155, 1 table.

Tabulation and brief discussion of the findings from examination of 275 birds belonging to 14 families and 23 species; 20 percent were infected.

Diseases and Parasites: Cestoda

Ameel, Donald J. Two larval cestodes from the muskrat, Trans. Amer. Microscopical Soc. (James E. Ackert, Kansas State College, Manhattan, Kans.), 61(3), July 1942, pp. 267-271, 1 pl.

Report on the parasites collected from 252 muskrats from Michigan (Trematoda, 8 spp.; Nematoda, 3; Cestoda 3). Two of the cestodes were in larval form and have not yet been identified. Available information and illustrations are given. Bibliography of 7 titles.

Diseases and Parasites: Cestoda, Hymenolepis

Brock, Mason E. A new hymenolepidid tapeworm, Hymenolepis filumferens, from the blue-winged teal, Trans. Amer. Microscopical Soc. (James E. Ackert, Kansas State College, Manhattan, Kans.), 61(2), April 1942, pp. 180-185, 1 pl.

Oklahoma. Original description, measurements, illustrations, comparative notes. Bibliography of 13 titles.

Diseases and Parasites: Cestoda, Hymenolepis

Polk, Seigul. A new hymenolepidid cestode, Hymenolepis dafilae, from a pintail duck, Trans. Amer. Microscopical Soc. (James E. Ackert, Kansas State College, Manhattan, Kans.), 61(2), April 1942, pp. 186-190, 1 pl.

Oklahoma. Original description, measurements, illustrations, comparative notes. Bibliography of 13 titles.

Diseases and Parasites: Cestoda, Ophiotaenia

Riser, Nathan W. A new proteocephalid from Amphiuma tridactylum Cuvier, Trans. Amer. Microscopical Soc. (James E. Ackert, Kansas State College, Manhattan, Kans.), 61(4), Oct. 1942, pp. 391-397, 1 pl.

Ophiotaenia alternans n. sp.; original description, measurements, illustrations, comparative notes (Tennessee). Bibliography of 10 titles.

Diseases and Parasites: Cestoda of reptiles

Hughes, R. Chester, John R. Baker, and C. Benton Dawson. The tapeworms of reptiles, Part II. Host catalogue, Jasmann Collector (University of San Francisco, Calif.), 4(3), April 1941, pp. 97-104.

Systematic list of hosts, with names of their parasites of this group.

Diseases and Parasites: Diptera, Hippoboscidae

Bequaert, J. Notes on Hippoboscidae. 18. The genus Brachyteromyia Williston; with the description of a new species (Diptera), Psyche (Prof. F. M. Carpenter, Biological Laboratories, Harvard University, Cambridge, Mass. 65 cents a copy), 49(3-4), Sept.-Dec. 1942, pp. 108-117, 1 fig.

Synonymy of the genus and characters of two species, one of which from Venezuela is described as new. The other, B. fimbriata, from the United States is known to parasitize the white-throated and black swifts.

Diseases and Parasites: Ectoparasites

Wilson, L. Wayne. Some mammalian ectoparasites from West Virginia, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 24(1), Feb. 1943, p. 102.

A list of Coleoptera, Anoplura, Hemiptera, Diptera, Siphonaptera, and Acarina identified from 6 species of mammals.

Diseases and Parasites: Nematoda, Böhmiella

Lucker, John T. A new trichostrongylid nematode from the stomachs of American squirrels, Journ. Washington Acad. Sci. (450 Ahnaip St., Menasha, Wisc. 50 cents a copy), 33(3), March 1943, pp. 75-79, 17 figs.

From gray and black squirrels, West Virginia, Virginia, and Georgia; description as new (Böhmiella wilsoni); comparative notes.

Diseases and Parasites: Nematoda, Physaloptera

Hill, William C. The genus Physaloptera Rudolphi 1819 (Nematoda: Physalopterinae), Jasmann Collector (University of San Francisco, Calif.), 4(2), Nov. 1940, pp. 60-70.

List of 120 described forms and of the classes of vertebrates infested; catalogue of 18 invalid names; 3-page bibliography.

Diseases and Parasites: Nematoda, Physalopterinae

Morgan, Danner B. The Physalopterinae (Nematoda) of aves, Trans. Amer. Microscopical Soc. (James E. Ackert, Kansas State College, Manhattan, Kans.), 62(1), Jan. 1943, pp. 72-80, 1 pl.

Historical notes; key to 10 species of Physaloptera (characters illustrated); host list for 11 species and of worms identified only to the genus; 2-page bibliography.

Diseases and Parasites: Nematoda, Protostrongylus

Dikmans, G. The lungworm Protostrongylus rushi Dikmans, 1937, of the mountain sheep, Ovis canadensis, Proc. Helminthological Soc. Washington (Edna M. Buhrer, U. S. Horticultural Station, Beltsville, Md. 50 cents a copy), 10(1), Jan. 1943, pp. 8-9, 1 fig.

Redescription, illustrations, comparative notes. Yellowstone Park, Wyo.

Diseases and Parasites: Nematoda, Protostrongylus

Goble, Frans S. Notes on the adults of Protostrongylus coburni in the lungs of White-tailed deer, Journ. Parasitology (Science Press, Lancaster, Pa.), 29(2), April 1943, p. 158.

Summary of results of some 700 autopsies of deer of this species in New York.

Diseases and Parasites: Nematoda, Soboliphyme

Bezdek, Hubert. Studies on the nematode Soboliphyme baturini Petrow, 1930, Trans. Amer. Microscopical Soc. (James E. Ackert, Kansas State College, Manhattan, Kans.), 61(4), Oct. 1942, pp. 398-403, 1 pl., 1 table.

From an Alaskan marten; description, illustrations, comparative notes; key to two species each representing a subfamily and tabulation of host records for them: S. baturini and S. soricis. Bibliography of 7 titles.

Diseases and Parasites: Nematoda, Viannaia

Dikmans, G. The occurrence of Viannaia viannai Travassos (Nematoda: Heligmosomidae) in opossums in North America, Proc. Helminthological Soc. Washington (Edna M. Buhrer, U. S. Horticultural Station, Beltsville, Md. 50 cents a copy), 10(1), Jan. 1943, pp. 6-7, 1 fig.

Maryland and Georgia; description of the genus and the species; illustrations.

Diseases and Parasites: Protozoa, Eimeria

Carvalho, Jose Candido M. Eimeria neoleporis n. sp., occurring naturally in the cottontail and transmissible to the tame rabbit, Iowa State College Journ. Science (Collegiate Press, Inc., Iowa State College, Ames. $1.00 a copy), 16(3), April 1942, pp. 409-410, 1 fig.

Original description, measurements, illustration, biological notes; Ames, Iowa.

Diseases and Parasites: Protozoa, Trypanosoma

Davis, Dorland J., Theodore McGregor, and Thelma de Shazo. Triatoma sanguisuga (Le Conte) and Triatoma ambigua Neiva as natural carriers of Trypanosoma cruzi in Texas, U. S. Public Health Reports (Supt. of Documents, Washington, D. C. 5 cents a copy), 58(9), Feb. 26, 1943, pp. 353-354.

Eight species of Triatoma occurring within the United States are known vectors of Trypanosoma cruzi. They are of frequent occurrence in the nests of wood rats. Bibliography of 8 titles.

Diseases and Parasites: Siphonaptera

Auguston, G. F. The tropical chigoe in California, Science (Science Press, Lancaster, Pa. 15 cents a copy), 96(2504), Dec. 25, 1942, p. 581.

This tropical and subtropical flea known to be a vector of pathogenic organisms is reported from a specimen of the Pacific horned owl (Bubo v. pacificus).

Diseases and Parasites: Trematoda

Petri, Leo H. Two new dicrocoelid trematodes from birds, Trans. Amer. Microscopical Soc. (James E. Ackert, Kansas State College, Manhattan, Kans.), 61(1), Jan. 1942, pp. 57-61, 1 pl.

Eurytrema ludovicianae n. sp. (from the rose-breasted grosbeak, Nebraska) and Athesmia butonsis n. sp. (from a Galapagos hawk, Buteo galapoensis); original descriptions, measurements, illustrations, comparative notes. Bibliography of 9 titles.

Diseases and Parasites: Trematoda, Dictyangium

Stunkard, Horace W. A new trematode, Dictyangium chelydrae (Microscaphidiidae = Angiodictyidae) from the snapping turtle, Chelydra serpentina, Journ. Parasitology (Science Press, Lancaster, Pa.), 29(2), April 1943, pp. 143-150, 1 pl.

Review of previous literature (18 titles cited) especially as to the nomenclature of the family. Description and illustration of the new species from Louisiana. Comparative notes.

Diseases and Parasites: Trematoda, Diplorchis

Rodgers, L. Ormand, and Robert E. Muntz. A new polystomatid monogenean fluke from a spadefoot, Wasmann Collector (University of San Francisco, Calif.), 4(2), Nov. 1940, pp. 37-40, 1 pl.

Diplorchis americana n. sp. from Scaphiopus couchii, Oklahoma; description, measurements, illustrations; comparative notes.

Diseases and Parasites: Trematoda, Fibricola

Chandler, Asa C. The morphology and life cycle of a new strigeid, Fibricola texensis, parasitic in raccoons, Trans. Amer. Microscopical Soc. (James E. Ackert, Kansas State College, Manhattan, Kans.), 61(2), April 1942, pp. 155-167, 1 pl.

Original description, measurements, illustrations, comparative notes, life cycle. Bibliography of 15 titles.

Diseases and Parasites: Trematoda, Protechinostoma

Beaver, Paul C. Studies on Protechinostoma mucronisertulatum, n.g., n.n. (Psilostomum reflexae Feldman, 1941), a trematode (Echinostomidae) from the sora rail, Journ. Parasitology (Science Press, Lancaster, Pa. $1.50 a copy), 29(1), Feb. 1943, pp. 65-70, 1 pl.

Description and figures of larval and adult stages; proposal as a new genus and species of this form which had previously been identified as Psilostomum reflexae Cort. Bibliography of 9 titles.

Diseases and Parasites: Of coot

Roudabush, Robert L. Parasites of the American coot (Fulica americana) in central Iowa, Iowa State College Journal of Science (Iowa State College Press, Ames. $1.00 a copy), 16(4), July 1942, pp. 437-441, 1 table.

Tabulation and discussion of parasites from 17 specimens collected in central Iowa. They included 4 protozoans, 4 trematodes, 3 cestodes, 2 nematodes, and 8 bird lice (Mallophaga). Bibliography of 9 titles.

Diseases and Parasites: Of deer

Van Volkenberg, H. L., and A. J. Nicholson. Parasitism and malnutrition of deer in Texas, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(2), April 1943, pp. 220-223, 1 table.

Mortality among Texas deer is discussed and report made on the external and internal parasites (4 and 6 species, respectively) collected from two specimens. Malnutrition is the basic cause of mortality; it should be counteracted in some localities and seasons by artificial feeding.

Diseases and Parasites: Of fox, red

Smith, Lawrence F. Internal parasites of the red fox in Iowa, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(2), April 1943, pp. 174-178, tables.

Report on autopsies of 234 carcasses, in which the methods employed and the results obtained are described. Five kinds of nematodes, 4 of cestodes, 2 of Coccidia, and 2 of insects were found; their degree of incidence are recorded. Previous findings as to red fox parasites are summarized and 14 references to the literature are given.

Diseases and Parasites: Of game birds

Wehr, Everett E., and Don R. Coburn. Some economically important parasites of the wild turkey and Hungarian partridge of Pennsylvania, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 13(11), Feb. 1943, pp. 14-15, 31, 4 photos.

Identity and life history of protozoans, tapeworms, and nematodes found in these Pennsylvania game birds, with notes on their pathology and suggestions for treatment.

Diseases and Parasites: Of Mustelidae

Morgan, Banner B. New host records of nematodes from Mustelidae (Carnivora), Journ. Parasitology (Science Press, Lancaster, Pa.), 29(2), April 1943, pp. 158-159.

Report on findings from post-mortem examinations of 82 specimens (both wild and ranch-raised) representing 8 species of this family.

Diseases and Parasites: Of squirrel, fox

Graham, Edward, and Jacob Uhrich. Animal parasites of the fox squirrel, Sciurus niger rufiventer, in southeastern Kansas, Journ. Parasitology (Science Press, Lancaster, Pa.), 29(2), April 1943, pp. 159-160.

References to previous publications on the subject and report on autopsies of 100 fox squirrels, all but 7 of which yielded parasites. The results are given in a tabulation covering 15 groups of external and internal parasites.

Ecology: Burning

Pearse, A. S. Effects of burning-over and raking-off litter on certain soil animals in the Duke Forest, American Midland Naturalist (Notre Dame, Ind. $1.00 a copy), 29(2), March 1943, pp. 406-424, 1 fig., tables.

Results of a 5-year study including the effects of the treatments mentioned on soil temperatures, and upon the number and variety of macroscopic animals. Both burning and raking reduced the total populations by about two-thirds. Two-page bibliography.

Ecology: Census methods

Studholme, Allan T. Some census methods for game, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 13(12), March 1943, pp. 10-11, 26-27, 31; 13(13), April 1943, pp. 8-9, 30, illus.

Reliable methods of estimating numbers of animals are of fundamental importance in wildlife management. The author discusses: "(1) Direct enumeration of whole areas or samples; (2) ratios based on trapping, banding, and later capture of sample individuals; [and] (3) observations on the density of populations through the use of indices." The article largely consists of a review of the methods that have been proposed or used. Bibliography of 12 titles.

Ecology: Census methods, big-game

Saugstad, Stanley. Aerial census of big game in North Dakota, Trans. Seventh N. A. Wildlife Conference 1942 (American Wildlife Institute, Investment Bldg., Washington, D. C. $1.00 a copy), pp. 343-354, 2 figs.

Trial of the drive method, the pellet count, and ground cruising revealed that they were not very satisfactory under North Dakota conditions. Airplane counting was then resorted to. The type of plane, the methods used, and experience of the observers are described and the results and costs reported. This manner of censusing is regarded as the most accurate, rapid, and economical that has been tried in the State.

Ecology: Census methods, deer

Morse, Marius A. Technique for reducing man-power in the deer drive census, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(2), April 1943, pp. 217-220, 1 fig.

Modification of the drive method to include counting of tracks under favorable snow conditions. Required man-power and cost were reduced 60 percent; other advantages are pointed out.

Ecology: Census methods, pheasant

Allen, Durward L. A pheasant inventory method based upon kill records and sex ratios, Trans. Seventh N. A. Wildlife Conference 1942 (American Wildlife Institute, Investment Bldg., Washington, D. C. $1.00 a copy), pp. 329-352, 2 tables.

Discussion and tabulation descriptive of a method of calculating pheasant populations from figures as to the number of cocks killed, the percentage surviving the hunting season, and the sex ratio. Michigan.

Ecology: Census methods, squirrel, fox

Hicks, Ellis A. Some major factors affecting the use of two inventory methods applicable to the western fox squirrel, Sciurus niger rufiventer (Geoffroy), Iowa State College Journ. Science (Iowa State College Press, Ames. $1.00 a copy), 16(2), Jan. 1942, pp. 299-305, 4 tables.

Description of study area, definition of census methods, record and discussion of observations. Author's summary: "(1) To learn something of the factors affecting activity of the fox squirrel, observations were made on a 250-acre timbered area in Story County over a period of 1.5 years; (2) two inventory methods known as linear count and spot count were used in the investigation; (3) use of these methods was greatly influenced by a large number of factors, namely, temperature, degree of cloudiness, topography, vegetative distribution and association, precipitation, season of year, hour of daily observation; (4) yearly observations indicate that the temperature bracket 31° F. to 50° F. was most conducive to squirrel activity; (5) much more activity occurred on clear days than on cloudy days; (6) seasonal division of data indicated that the peak of activity occurred in fall. Activity during each of spring and summer was about half that of fall, while winter movement was slightly less than that in either spring or summer; (7) the two methods of count substantiated each other in indicating the time of day during which squirrel activity was most pronounced. The peak of activity occurred from 8:00 a.m.-10:00 a.m. with a minor surge from 1:00 p.m.-2:00 p.m."

Ecology: Populations, bird

Beecher, Wm. J. Nesting birds and the vegetation substrate, Chicago Ornithological Society, 69 pp., 1 pl., 10 figs., 2 tables, 1942. (Obtainable from the Field Museum Book Shop, Chicago, Ill. $1.00 a copy).

Study of breeding birds in relation to the vegetation of a 482-acre tract on the shore of Pistakee Lake, Illinois. The geological history, and plant associations are discussed; the study area included both marsh and upland types, chiefly the former. Methods of counting breeding bird populations are reviewed and those used by the author are outlined. He was very successful in finding nests--up to 1,332 in a single season. The record of the findings for 72 species of birds show the numbers of nests found in the different plant formations and give index figures of the number of acres per nest. The number of nests is also correlated with the amount of edge per acre. [The author's

remark that edge effect had not before been quantitatively measured omits consideration of the paper by Dambach and Good in Journ. Wildlife Management, 4(1), Jan. 1940, pp. 63-76.] In general, population density varied directly with the amount of edge per unit area. The author's discussion undoubtedly advances understanding of edge effect. Consideration of the results in the light of Raunkaier's law of frequency led to the conclusion that nest frequency depends upon the frequency of communities per acre (that is, increasing floral diversification), which seems only another way of stating edge effect. The breeding periods of the birds and the vertical distribution of nests are discussed and graphed for 15 common species. Surprisingly, the familiar robin, which sometimes nests so low, occupies the ultimate niche for height among these species. While the character of the vegetation was the prime limiting factor in the distribution of nesting birds, it is certain that broad physical characteristics of the nest site rather than its absolute composition determine its availability. The birds, moreover, are adaptable and thus are not entirely bound to a particular type of site. The author apparently subscribes to conventional theories of competition but says that, from his study, convincing instances of a limiting type of competition would be difficult to demonstrate. Changes from ancestral nesting habits are noted, tabulated, and discussed; present adaptiveness is in inverse ratio to past specialization. The bibliography extends to nearly 3 pages. Good field work, somewhat overelaborately reported. The originality of the former would have been better matched by greater independence of fashionable theory and terminology. If, for example, ecesis merely means invasion (p. 3), what is its excuse for being? The word "substrate," also, could have been omitted from the title and elsewhere and no harm done.

Ecology: Populations, mice

Evans, F. C. Studies of a small mammal population in Bagley Wood, Berkshire, Journ. Animal Ecology (Cambridge University Press, 200 Euston Road, London, N. W. 1, England. 20 shillings a copy), 11(2), Nov. 1942, pp. 182-197, 5 figs., 12 tables.

Author's summary: "(1) A small mammal population in Bagley Wood, Berkshire, was studied from October 1936 through February 1939 by trapping and marking techniques; (2) the areas in which trapping was carried on provided a relatively large number of distinct and easily separated habitat types within a few acres. Two types of trapping grid were employed, and four nights of trapping completed the monthly census in each area. Individual mice were marked on the leg with a nickel ring and were also weighed; (3) the chief species studied were the wood-mouse (Apodemus sylvaticus) and bank-vole (Clethrionomys glareolus). Fluctuations in the numbers of both species were observed, and factors contributing to these changes are discussed. (a) About one-half of the population disappeared within one month after first capture; (b) the decrease in numbers caught to a very low relative density in the spring of 1938 (subsequent to a relatively high density and an increased number of deaths in traps) suggested some mortality factor; (c) Apodemus was found to be a wider-ranging animal than Clethrionomys, but both species tended to restrict their activity to a fairly small home range; (d) immigration and emigration apparently played a definite role in the population fluctuations; (e) it was

suggested that weather changes may have affected the numbers of animals caught; (f) the sex ratio approximated to 1:1 for the total number of individuals caught, but males preponderated in the spring and autumn; (g) the population of both species showed a general increase of weight with the onset of the breeding season; (4) statistical analysis showed that the distribution of the population in the trapping areas was not random. Certain habitat types appeared to be avoided. The distribution of Apodemus could not be associated with any one habit factor, but the greatest number of Clethrionomys were taken at trap locations in bracken (Pteridium aquilinum) areas; (5) the distribution of Clethrionomys appeared to be associated with its relative density. The population 'survival' from a period of high density to one of low density appeared to be greatest in those habitats which had normally maintained a low population density. It is suggested that habitats which will maintain only low densities may be essential to the ultimate survival of a species." Bibliography of 12 titles.

Economics: Foxes

Surber, T. Sir Reynard--Saint or Sinner?, Conservation Volunteer. (Minnesota Dept. of Conservation, St. Paul), 6(33), June 1943, pp. 13-16, 1 pl.

Comment on the value of fox pelts and on the status of the animals in fur farming and hunting. Anecdotes about foxes with some notes on their food habits. The author concludes that "there can be no doubt that Sir Reynard's character is a blend of the good and the bad. But the evidence indicates that he has been blasphemed more than he deserves. Whereas the fox occasionally enjoys a pheasant or grouse dinner, more often his victims are mice, ground squirrels and other rodents that are harmful to man's interests."

Economics: Propagated game birds

Nestler, Ralph B., and Arnold L. Nelson. The industrial aspects of pheasant and quail propagation in North America for 1939-40, Trans. Seventh N. A. Wildlife Conference 1942 (American Wildlife Institute, Investment Bldg., Washington, D. C. $1.00 a copy), pp. 115-130, 9 figs., 7 tables.

A report on the status of game bird propagation in the United States and Canada in 1940. From authors' summary: "According to the 16th Decennial Census of the United States, taken in 1939, more than 543,000 pheasants and 151,000 quail were raised on farms throughout the United States, not including figures from states reporting less than three farms. The number produced in 1940 on state game farms or in cooperation with such farms, shown on returns from questionnaires completed by the various state game or conservation departments, was 889,000 pheasants and nearly 300,000 quail. During the same year state game departments purchased from private breeders 153,000 pheasants and 62,000 quail. This makes a total of 1,042,000 pheasants and 362,000 quail raised or purchased by the states. If the former species is valued at about $1.25 and the latter at $.75 each, these 1,404,000 birds would be worth 1-1/2 million dollars. According to the 16th Decennial Census, 669 farms reported production of pheasants during 1939, the average number raised per farm being

829 birds. The same census showed that in the spring of 1940, the number of farms reporting pheasants increased from 669 to 952, a 42 per cent increase. During 1939 at least 199 farms raised quail, the average number of birds produced on each being 818. In the spring of the following year the number of farms reporting quail increased from 199 to 274, a 38 per cent increase.

"Pheasants and quail are raised primarily for restocking areas depleted of game. The state game departments are the greatest producers of game birds for these purposes. Propagated game birds, however, can be legally sold in 37 states for meat, under varying types of restrictions. Thirty states allow sale of all kinds of pen-raised game birds for meat; three states restrict sales to pheasants exclusively, and one state limits sales to exotic species. Based partly on estimates and partly on sales reports, at least 35,000 pen-raised game birds were sold for meat during 1940."

Education: Conservation

Authors. The foundations of conservation education, National Wildlife Federation (1212 Sixteenth St., N.W., Washington, D. C. Paper, 60 cents, buckram, $1.00, a copy), vi+242 pp., 12 pls., 1941.

A book of six chapters on various aspects of the subject, of which two have application to wildlife. One by Henry B. Ward on "Biology as the foundation of conservation education" (pp. 135-242) asserts that "life and the study of life are of supreme importance," and wise use of natural resources based on biological principles is fundamental to human welfare, but that teaching of biology has declined, must be restored, and its texts rewritten. The other chapter by W. W. and Richard W. Horner, "The role of applied science in conservation and its relation to wildlife" (pp. 73-134) is written mainly from the engineering point of view. Accordingly it deals mostly with drainage, pollution, and water control, the relations of which to wildlife are sympathetically treated. The book is not a text but a presentation of conservation principles addressed to teachers to whom it should be both informative and inspirational.

Education: Land ecology

Leopold, Aldo. The role of wildlife in a liberal education, Trans. Seventh N. A. Wildlife Conference 1942 (American Wildlife Institute, Investment Bldg., Washington, D. C. $1.00 a copy), pp. 485-489, 1 fig.

Instead of teaching wildlife to prospective professionals, the author would instruct citizens in general to see the land, understand what he sees, and enjoy what he understands. Sciences are separate only in the classroom; out of doors they are fused. Land ecology is putting the sciences and arts together for the purpose of understanding our environment. Man is integral with that environment and should wholeheartedly adopt and act upon an ecological concept of life. Teachers in the wildlife field have an opportunity to expand into the much needed promotion of an ecological land discipline, beneficiaries of which will have lifelong opportunity to continue their education.

Education: Nature study

Bathurst, Effie G. Phonograph records as an aid to learning in rural elementary schools, University of the State of New York (Albany), 171 pp., 9 pls., 4 tables, 1943.

Report on an experiment in making phonograph records for the purpose indicated and upon their evaluation through trial. The test was regarded as a success and it is hoped in post-war times to make the records commercially available to schools. Stress was placed on nature study, as indicated by such series titles as: "We build a nature trail," "Making better use of nature," and "Do you know the birds?" The handbook describes the records in some detail, and for each states the objectives, curriculum experiences, questions that the teacher and pupils have discussed, and examples of use. A minimum bibliography for teachers is presented and acknowledgments are made to a considerable number of specialists who contributed to the experiment.

Education: Wildlife conservation

Bennitt, Rudolf. The nature and scope of training graduates in wildlife conservation, Trans. Seventh N. A. Wildlife Conference 1942 (American Wildlife Institute, Investment Bldg., Washington, D. C. $1.00 a copy), pp. 495-505, tables.

Discussion based upon returns from 24 institutions to a questionary regarding the objectives and functions of graduate training in wildlife conservation. At the eleventh hour, inquiries were made as to the effects of the war upon graduate-student morale, availability of funds, and the teaching program and asked for predictions as to post-war conditions. After disposing of these topics, the author treats: A mind of professional caliber; principles vs. practice; filling the undergraduate gaps (i.e. in training); responsibility for technical skills, habits, and viewpoints; scientific repute of wildlife work; relation to other fields; cooperation with state conservation departments; doctoral degrees; standardized curriculum; course work vs. special work; research at the master's level; relative importance of research on master's thesis; publication of the theses; examinations; seminars; experience in hunting, fishing, and trapping; participation in conferences; subsidization of graduate students; outscoring the faculty; play of graduate students; shortcomings of the students as a group.

As written English, speech, and breadth of view received most criticism, it is evident that the faculties concerned share the views of Professor English as noted in the following abstract.

Education: Wildlife conservation

English, P. F. The nature and scope of training undergraduates in wildlife conservation, Trans. Seventh N. A. Wildlife Conference 1942 (American Wildlife Institute, Investment Bldg., Washington, D. C. $1.00 c copy), pp. 489-494.

More fundamental training is required for a career in wildlife management than can be crowded into an undergraduate course of four years. The student should work in as much of the basic courses as he can, but he will have to supplement them and do any specializing that he plans in a graduate school. The student in this field should have health, interest in hunting and fishing, and facility in public relations. He must receive such training that he will make no serious mistakes in environmental manipulation, he must be able to write clearly and speak fluently, and be able to work with people.

Education: Wildlife conservation

Van Dersal, William R. The viewpoint of employers in the fields of wildlife conservation, Trans. Seventh N. A. Wildlife Conference 1942 (American Wildlife Institute, Investment Bldg., Washington, D. C. $1.00 a copy), pp. 506-517, 1 table.

The author reviews the principal Federal, State, and private employers and classifies the kinds of work they do. He presents a tabulation of the number of men employed in wildlife conservation by eight agencies or groups of agencies. Of the entire number, only about 10 percent have had technical training in this field. The total (that for private and special agencies being unknown) is more than 8,000. The results of the author's inquiries are presented under the heads: Fields of knowledge of candidates, personal qualifications, weaknesses in recent candidates, scientific attitude and understanding of land-use principles. There should be cooperation between teachers and employers in the conservation field so that the development of professional biologists can be put on a firm and enduring basis.

Food Habits: Birds in relation to food production

Collinge, Walter E. Wild birds and home-grown food in Britain, Nature (St. Martin's St., London, W.C. 2, England. 1 shilling, 6 pence a copy), 151(3822), Jan. 30, 1943, pp. 128-129.

"Ill-informed people are advocating the destruction of rooks, gulls, blackbirds, thrushes and other insect-eating birds," writes Dr. Collinge. Apparently this is a bit of that war-time hysteria that never fails to manifest itself. He ably combats it by summarizing the food habits of the groups of birds mentioned as well as of the titmice. He recommends control, however, of the starling, house-sparrow, and wood-pigeon and warns of the need of positive governmental action in the field of economic ornithology.

Food Habits: Utilization of aspen by beavers

Gese, Edward C., and Albert R. Shadle. Reforestation of aspen after complete cutting by beavers, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(2), April 1943, pp. 223-228, 2 figs., 2 tables.

Contrary to prevailing impression, aspens grow slowly and in Allegany State Park, New York, 20 years are required to produce trees of optimum age

and size for complete use by the beavers and 35 years for maximum production of food for the animals. Propagation by cuttings seems the most practicable method of reforestation where needed. Bibliography of 9 titles.

Food Habits: Utilization of Lespedeza bicolor

Davison, Verne E. Bicolor lespedeza--a better bobwhite food, North Carolina Wildlife Conservation (Division of Game and Inland Fisheries, Raleigh, N. C.), 7(4), April 1943, pp. 8-9, 14, 2 photos, 1 table.

The seeds of this shrubby species are readily taken by bobwhites, the bark is eaten freely by cottontails, and the flowers are attractive to honeybees. Thirty-five bobwhites taken in winter near or in plantings of Lespedeza bicolor had made half of their food of the seeds of this plant. It is being widely propagated by direct seeding and is especially recommended for use along woodland borders.

Food Habits: Utilization of Lespedeza bicolor

Pearson, Allen M. Quail fond of new lespedeza, Alabama Conservation (Alabama Dept. of Conservation, Montgomery. 5 cents a copy), 14(11), May 1943, pp. 7, 12, 3 photos.

The seeds of the shrubby Lespedeza bicolor are freely eaten by bobwhites and the bark by cottontails. The plant is readily propagated by seed.

Food Habits: Of armadillo

Baker, Rollin H. May food habits of armadillos in eastern Texas, American Midland Naturalist (Notre Dame, Ind. $1.00 a copy), 29(2), March 1943, pp. 379-380, 1 table.

Report on the contents of 25 stomachs, recorded in only one instance to a group smaller than a family. Insects and earthworms together made up 90 percent of the food.

Food Habits: Of bear, black

Bennett, Logan J., P. F. English, and R. L. Watts. The food habits of the black bear in Pennsylvania, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 24(1), Feb. 1943, pp. 25-31, 1 fig., 5 tables.

Distribution and game value are discussed; average yearly kill, 452. The State Game Commission pays for verified damages to livestock and property; yearly payments have run from $423 to $2,999. This paper reports upon analyses of 119 scats and 7 stomachs from Pennsylvania and of 6 scats from Maine. Predominant items in summer scats were: Wild cherries, 52.7 percent of the volume; acorns, 12.6; wax and bees, 11.5; woodchuck, 5.7; and blackberry, 4.6 percent. The material found in fall and winter scats included acorns, 36.3; beechnuts, 31.1; apples, 10.9; and wild grapes, 9.2 percent.

Food Habits: Of beaver

Shadle, Albert R., Alma M. Nauth, Edward C. Gese, and Thomas S. Austin. Comparison of tree cuttings of six beaver colonies in Allegany State Park, New York, Journ. Mammalogy (Ernest T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 24(1), Feb. 1943, pp. 32-39, 3 tables.

The cuttings are tabulated and discussed by beaver colonies, by plant genera, and by stump diameters of the trees. The total for 6 colonies in a total of 182 months of observation was 5,424; 74.4 percent were less than 3 inches in diameter, and only 7.6 percent more than 6 inches. Of representatives of 17 genera cut, those of 3, Populus and Carpinus, furnished 56.9 percent of the total cuttings. Only 1.4 percent of all trees felled were unused. Bibliography of 7 titles.

Food Habits: Of bobwhite

Degarmo, W. Russell. Food habits of quail, West Virginia Conservation (Conservation Commission, Charleston, W. Va.), 7(2), May 1943, pp. 10, 17-18.

Report upon "rough examination" of 105 crops collected in Jackson County in November and December. The leading food items were: corn, seeds of Korean lespedeza, soybeans, beggar lice, and hog peanuts. The occurrence, both in frequency and volume, of all foods identified is discussed.

Food Habits: Of deer

Hill, Ralph R., and Dave Harris. Food preferences of Black Hills deer, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(2), April 1943, pp. 233-235, 1 table.

Report on analyses of the stomach contents of 79 white-tailed, and 20 mule, deer, presented for 3 seasonal groups of the former species, and in aggregate for the latter. Both frequency of occurrence and volume are stated. Leading items, by bulk, for the whitetail were bearberry, ponderosa pine, and buckbrush (Symphoricarpos) browse; and for the mule deer, Oregon grape, bearberry, and buckbrush.

Food Habits: Of fox, red

Scott, Thos. G. An investigation of the food coactions of the Northern Plains red fox, Iowa State College Journ. of Science (Iowa State College Press, Ames. $1.00 a copy), 17(1), Oct. 1942, pp. 117-119.

Abstract of a doctoral thesis. The field work of this investigation was carried out in central Iowa, with occasional observations in other parts of the State, through the period June 1938 to July 1941. On the basis of 1,454 scat analyses, "the red foxes were found to be primarily carnivorous with substantial quantities of insect and plant foods being consumed when available. Warm-blooded vertebrates were less frequent in the warm weather

diet than in the cold weather diet, whereas, the reverse was true for insects and plant foods. The principal staple foods were cottontails and mice, especially Peromyscus and Microtus. The red foxes seemed to have food preferences. The meadow mouse was high on the scale of preferences. Insectivores and weasels were regularly left uneaten. Weasels appeared to be particularly unsatisfactory as food. Carrion that was advanced in decay did not seem to be attractive food for the foxes."

Food Habits: Of grouse, ruffed

Kittams, Walter H. October foods of ruffed grouse in Maine, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Ia. $1.00 a copy), 7(2), April 1943, pp. 231-233, 1 table.

Report on contents of 34 crops and gizzards by the volumetric method. The food items are tabulated and discussed. The most important were clover leaves, aspen buds and leaves, and hawthorn fruits. Bibliography of 6 titles.

Food Habits: Of grouse, ruffed

Polderboer, Emmett B. Seasonal food preference trends of eastern grouse in Iowa as shown by dropping analysis, Iowa State College Journ. of Science (Iowa State College Press, Ames. $1.00 a copy), 16(3), April 1942, pp. 331-335, 2 tables.

Report on contents of 176 fecal samples collected in northeastern Iowa. The foods utilized are listed in the order of seasonal frequency. Of the food consumed throughout the year, fruits and seeds together formed 29.9 percent, buds, 23.8, and leaves, 21.4.

Food Habits: Of mink

Yeager, Lee E. Storing of muskrats and other foods by minks, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 24(1), Feb. 1943, pp. 100-101, 1 table.

A cache on the shore of Rice Lake, near Banner, Illinois, contained 13 freshly-killed muskrats, 2 mallards, and 1 coot. The table records observations of 9 other authors on food storage by minks. Despite the fact that one mink pelt is worth as much as 3-4 of muskrats, some marsh owners try to suppress minks, as they believe that one mink may destroy 100 or more muskrats in a year.

Food Habits: Of rabbits

Riegel, Andrew. Some observations of the food coactions of rabbits in western Kansas during periods of stress, Trans. Kansas Acad. Sci. (John C. Frazier, Sec'y., Manhattan, Kans.), 45, 1942, pp. 369-375, 2 pls., tables.

Both jack rabbits and cottontails are almost entirely vegetarian. Shifts from preferred to emergency foods are made under the stress of drought

or snow conditions. Author's summary: "The jackrabbits and cottontails are common residents of the Great Plains and the most numerous species of wild game. Prickly pear cactus, broom weed, pig weed, and sand dropseed grass appear to be the favored food plants of rabbits on the range during favorable and unfavorable times. During drought periods, forbs with succulent roots are sought out and cactus pads and fruits are eaten in large quantities. While heavy snows covered the ground rabbits ate quantities of dried remnants of Russian thistle, buffalo bur, sand dropseed, yucca, and cottontails ate cedar berries and twigs of ornamental shrubs. Considerable numbers of spines of buffalo bur and prickly pear were found in the pellets of rabbits. Rabbits act as agents of dispersal for several species of plants by disseminating them in their fecal pellets, sand dropseed, prickly pear and pig weed being principal seeds observed in fecal pellets. Germination tests indicate that some of these seeds are viable. Rabbits may have a part in the early appearance of sand dropseed in land retired from cultivation." Bibliography of 6 titles.

Food Habits: Of raven

Knowlton, G. F. Raven eats Mormon cricket eggs, Auk (J. Fletcher Street, 1120 Locust St., Philadelphia, Pa. $1.00 a copy), 60(2), April 1943, p. 273.

Notes on contents of 5 stomachs collected in Utah; one held remains of 3 adult female Mormon crickets, including 285 eggs.

Food Habits: Of robin

Hamilton, W. J., Jr. Spring food of the robin in central New York, Auk (J. Fletcher Street, 1120 Locust St., Philadelphia, Pa. $1.00 a copy), 60(2), April 1943, p. 273.

Results of dropping analyses additional to those recorded by the author in Wilson Bulletin, 52(3):179-182, 1940. By percentage of frequency of occurrence, seeds of barberry and sumac led among plant foods, and beetles, millipeds, and ants among animal items.

Food Habits: Of sapsucker, yellow-bellied

Stoner, Dayton. Yellow-bellied sapsucker, tree troubler, Univ. State of New York, Bul. to the Schools (Albany. 10 cents a copy), 29(7), March 1943, pp. 266-270, 6 photos.

Brief account of the life history of the sapsucker, review of its food habits, and account of local damage in New York to Austrian pines. Discussion of the bird's economic status and recommendation of a charitable view (in which the abstracter who has detailed the injurious habits of sapsuckers heartily joins).

Food Habits: Of shore birds

Spawn, Gerald Bishop. Food habits of shorebirds (Charadriiformes) in northwestern Iowa, Iowa State College Journ. of Science (Iowa State College Press, Ames. $1.00 a copy), 17(1), Oct. 1942, pp. 133-135.

Abstract of a doctoral thesis. In this investigation 152 stomachs of shore birds were examined, all but two of which were collected in the Ruthven Area, Clay and Palo Alto counties, Iowa. Most of these were taken in the fall of 1934 and represented four species: Wilson's snipe, dowitcher, and the lesser and greater yellowlegs. Insects were found in 93.65 percent of the 67 snipe stomachs examined, including fly larvae in 64.18. In 11 dowitcher stomachs, insects formed 85 to 90 percent of the diet. "Comparison of food habits of dowitchers and snipe shows that when collected from the same type of habitat there are relatively few differences between these species as to food taken. When collected from their more typical habitats there are certain rather distinct differences in the food habits. Availability and relative abundance of the kinds of animal food found in the type of habitat chosen in each case are the principal factors in determining the variety and amounts of such foods taken. Food preferences which might be indicated by the birds are believed to be of secondary importance." While insects were also the principal item of subsistence of the lesser yellowlegs as shown by analysis of 71 stomachs, the forms taken were somewhat different from those utilized by the snipe and dowitchers. No conclusions were based upon the examination of the stomach contents of only three greater yellowlegs.

Food Habits: Of squirrel, gray

Hamilton, W. J., Jr. Caterpillars as food of the gray squirrel, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 24(1), Feb. 1943, p. 104.

Of the Halfwing geometer (Phigalia tilea), presumably near Ithaca, New York.

Food Habits: Of turtles

Lagler, Karl F. Food habits and economic relations of the turtles of Michigan with special reference to fish management, American Midland Naturalist (Notre Dame, Ind. $1.00 a copy), 29(2), March 1943, pp. 257-312, 9 figs., 9 tables.

Range, habitat, habits, and size are briefly treated, and food habits detailed so far as the material permits, for 8 species. The economic relations of the turtles to fish management are discussed, the paper is summarized, and a 4-page bibliography presented. The most comprehensive report that has been published on the food habits of the American turtles.

Food Habits: Of Uta stansburiana

Knowlton, G. F., W. Don Fronk, and D. R. Maddock. Seasonal insect food of the brown-shouldered Uta (Lizard), Journ. Economic Entomology (E. N. Cory, College Park, Md. 75 cents a copy), 35(6), Dec. 1942, p. 942, 2 tables.

Tabulation of insect foods found in 2,798 specimens. Eutettix tenellus, the beet leafhopper, was found in more than half of the stomachs including some collected in every month. The average count of the leafhoppers for the individuals in which it was found was 10.27. The occurrence of insects (classed to orders) in the stomachs is tabulated for the periods July-August, and September-October. Heteroptera and Homoptera were most important, numerically. Sometimes the lizards congregated in populations estimated at 200 to 700 per acre.

Introductions: Coypu

Larrison, Earl J. Feral coypus in the Pacific Northwest, Murrelet (Museum Bldg., University of Washington, Seattle, Wash. 70 cents a copy), 24(1), Jan.-April 1943, pp. 3-9, 1 map.

This South American rodent (Myocastor coypus), "about the size of a beaver," is apparently well established in Washington and Oregon as a result of escapes or liberations from fur farms. These records, the value of the animals in the local fauna, and its future prospects are discussed. Bibliography of 7 titles.

Introductions: Muskrat

Twining, Howard, and Arthur L. Hensley. The distribution of muskrats in California, California Fish and Game (Ferry Bldg., San Francisco, Calif.), 29(2), April 1943, pp. 64-78, Figs. 22-26.

Muskrats, originally occupying only restricted and widely separated areas in California, have so profited by irrigation developments and by introductions that their range has been expanded many fold. Attractive prices for pelts have encouraged trapping and in recent years nearly 70,000 animals have been taken each season. The distribution of the catch in 1940-41 and of the animals themselves is mapped and the occurrence of the animals and the status of trapping are discussed by counties and subordinate localities.

Life Histories: Beaver

Cook, David B. History of a beaver colony, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 24(1), Feb. 1943, pp. 12-18, 1 pl., 1 fig.

Yearly history and discussion of the vicissitudes of a colony in Rensselaer County, N. Y., resulting from the reintroduction of a single pair. During 8 years the original pair produced 17 young; the colony built 4 dams and 5 lodges. They have cut the trees from 9 acres of inferior second-growth hardwoods.

Life Histories: Bighorn

Spencer, Clifford C. Notes on the life history of Rocky Mountain bighorn sheep in the Tarryall Mountains of Colorado, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 24(1), Feb. 1943, pp. 1-11, 2 pls.

The present paper discusses: seasonal ranges, breeding habits, fighting, lambing season, voice, food habits (a list is given of plants eaten; sedges, grasses, and forbs are preferred), losses (from coyote, mountain lion, and poaching; none from eagles), range conditions (good), range competition (not serious). Identifications of ticks, coccidia, and stomach worms are recorded. Magpies were observed to remove ticks from the sheep. (An incidental note lists prairie dogs and rabbits as food of the golden eagle.) The herd twice (1885, 1924) severely reduced by epizootics now numbers about 400 and is increasing. "Factors responsible for this increase appear to be: a. sufficient yearlong range for more than the present numbers in the herd, b. favorable conditions and extensive south slopes for winter range, c. no excessive loss from predation or poaching, d. no known loss from disease or parasites, e. excellent lamb crops with indicated survivals of 70 percent as yearlings, f. favorable attitude toward and protection afforded these sheep by the local ranchers."

Life Histories: Coot

Sooter, Clarence A. Ecology and management of the American coot Fulica americana americana Gmelin, Iowa State College Journ. of Science (Iowa State College Press, Ames. $1.00 a copy), 17(1), Oct. 1942, pp. 126-128.

Abstract of a doctoral thesis on an investigation in northern Iowa during 1936-37. Description of nests, location, number of eggs laid, incubation, hatchability, and agents responsible for the destruction of nests are given. Approximately two young were produced by each pair of coots nesting in the area studied in 1937. The weather destroyed more nests than any other agent. The food of the coot consisted largely of the most available plant material; the four more important sources as shown by stomach examinations being pondweed, sedge, smartweed, and hornwort. Animal food was more prominent in the diet of the young than in that of adults. The marshes of northwest Iowa could be made to produce more coots by fencing against livestock.

Life Histories: Cottontail

Hendrickson, George O. Mearns cottontail investigations in Iowa, Ames Forester (Dept. of Forestry, Iowa State College, Ames. $1.00 a copy), 21, 1943, pp. 59-73, 1 photo.

Record of observations on the behavior and breeding of captive animals and on natural nests, including number of young. Factors affecting survival are discussed and suggestions for management made. Reference is made to to tularemia, parasites, and predators. A review of the Iowa work 1936 to date. Bibliography of 24 titles.

Life Histories: Dove, Mourning

McClure, H. Elliott. Ecology and management of the mourning dove, Zenaidura macroura (Linn.), in Cass County, Iowa, Iowa Agr. Expt. Sta. (Ames) Research Bul. 310, pp. 356-415, 36 tables, Feb. 1943.

A comprehensive report upon 3 years of study. It treats of production, nesting habits, development of the young, decimating factors, and food habits; lists the external parasites observed, comments on migration especially as revealed by returns of banded birds, and makes management suggestions. Robins' nests are appropriated by doves as foundations for their own. English sparrows are strong competitors of the dove for food. Bibliography of 59 titles.

Life Histories: Elk

Schwartz, John E. Range conditions and management of the Roosevelt elk on the Olympic peninsula, U. S. Forest Service, North Pacific Region (Portland, Oreg.), 65 pp., 18 figs., 22 tables (mimeographed), [1943].

Report on a cooperative study made by the U. S. Forest Service, the Biological Survey (now Fish and Wildlife Service), and the Washington State Game Department. The range of the subspecies is described, and present numbers estimated at from 6,000 to 7,000; the history of elk in the region from the time of overexploitation, through later protection, and culminating in overpopulation of certain areas is sketched. A section on general description and life history treats: weights, measurements, molt, herd tendencies, development of antlers, mating, breeding, calving, migrations, daily movements, and feeding habits. Data on plant utilization are presented in some detail and tables record the comparative values of trees, shrubs, grasses, weeds, ferns, and mosses in the diet. There is a report on the contents (by volume) of 9 stomach samples. Mineral requirements are discussed. The winter and summer ranges are described, mapped, and appraisal of their condition noted. Populations by districts and by sex and age classes are estimated and losses analyzed as to cause and summarized. Malnutrition, diseases, and parasites receive attention as do also the effects of predation and hunting. Notes are presented on the food habits of the cougar, bobcat, and black bear. The elks damage crops and fences, hence methods of control are suggested. Previous investigations are summarized and reports upon them cited. There is also a separate bibliography of 13 titles. A comprehensive report worthy of a more permanent form of publication.

Life Histories: Natrix kirtlandi

Conant, Roger. Studies of North American water snakes--Natrix kirtlandi (Kennicott), American Midland Naturalist (Notre Dame, Ind. $1.00 a copy), 29(2), March 1943, pp. 313-341, 1 pl., 2 figs., 1 table.

History of knowledge of this species, taxonomy, synonymy, conspectus of material studied, morphology, coloration, geographic variation, range, habitat, habits, and relationships are discussed and there is a 5-page bibliography.

Life Histories: Partridge, Hungarian

Hart, Frank E. Hungarian partridges in Ohio, Ohio Conservation Bul. (Division of Conservation, State Office Bldg., Columbus. 10 cents a copy), 7(4), April 1943, pp. 4-5, 26, 4 photos.

As a result of two periods (1909-16, 1924-30) of rather liberal stocking, these birds were well established in 9 counties, in some parts of which they attained populations of 100-125 per square mile. However, in 1934-36, there were great decreases in these areas. To get further light on the reasons for success and failure, a study of the birds was carried on in 1942, upon which this article is a report. It includes notes on the breeding season, cover preferences, nesting, care of young, seasonal movements, and environmental limitations. In the Madison County study area, on the average, a pair produced 15 eggs, 76.6 percent of which hatched, and the population was 1 bird to 17.7 acres.

Life Histories: Partridge, Hungarian

Yocom, Charles F. The Hungarian partridge Perdix perdix Linn. in the Palouse Region, Washington, Ecological Monographs (Duke University Press, Durham, N. C. $1.50 a copy), 13(2), April 1943, pp. 167-201, 17 figs., 30 tables.

The region and the study area are ecologically described and mapped. Characteristics of the partridge are discussed, including sex ratio (even), weights (male avg. 13.61, female 12.8, ounces), sex differentiation in plumage, age distinctions, flight, flushing distances, cruising radius, calls, and seasonal ranges. Importations into the United States and liberations in the west, including the study region, are reviewed; in this area phenomenal success was achieved. The distribution of the Hungarian partridge in the Old World is summarized, and in the New, detailed and mapped. There are only 2 areas of successful establishment, the northwestern, and the Wisconsin to Ohio, tracts. The relationship of the partridges to other birds is discussed. Among life history topics taken up are: Prenesting activities, nesting (losses 67.5 percent, due as usual largely to man), broods (47 percent lost in the first two weeks), food habits (with review of the findings of previous investigators), populations, and mortality factors (including predators, parasites, and diseases). Management suggestions are made, the paper is fully summarized, and a bibliography of 34 titles is presented. An excellent report on a very desirable species.

Life Histories: Pheasant

Baskett, Thomas Sebree. Production of the ring-necked pheasant (Phasianus colchicus torquatus Gmelin) in north-central Iowa, Iowa State College Journ. of Science (Iowa State College Press, Ames. $1.00 a copy), 17(1), Oct. 1942, pp. 30-33.

Abstract of a doctoral thesis on the behavior of the pheasant, nesting cycle, and the relationships between natural pheasant production and agricultural practices, weather, and other environmental conditions carried out during

the breeding seasons of 1939-1941. The study area was used chiefly for agricultural purposes, hence a large percentage of the nests were located in hay fields, and a lesser proportion in fields of small grain and in fence rows. The proportion of successful nests was highest in small grain and lowest in hay but the later the hay was mowed the higher the percentage of successful nests. Nearly a third of all nests lost were deserted due to disturbance by man. Crows were responsible for about a fifth of the total nest destruction. Nesting losses are largely made up for by renestings. "It was estimated that in 1939, 352 chicks hatched and left the nests on the 1,520-acre study area; for 1940 the estimate was 528, and for 1941, 954. During the first seven weeks after hatching, there were losses of about 2.6 chicks per brood in 1939, 3.3 chicks per brood in 1940, and 5.3 chicks per brood in 1941. The following estimated numbers of chicks attained the age of seven weeks: in 1939, 247; in 1940, 355; and in 1941, 583."

Life Histories: Raccoon

Giles, LeRoy W. Evidences of raccoon mobility obtained by tagging, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(2), April 1943, p. 235, 1 table.

Returns from 19 out of 306 tagged animals indicated dispersal up to 75 miles in a direct line from the point of release, the males being the greater wanderers.

Life Histories: Raccoon

Stuewer, Frederick W. Raccoons: their habits and management in Michigan, Ecological Monographs (Duke University Press, Durham, N. C. $1.50 a copy), 13(2), April 1943, pp. 203-257, 55 figs., 16 tables.

The author describes the area and the methods of his study (including holding and marking procedures). Under general characteristics he treats: Appearance, physical qualities, voice, sense of smell, nocturnalism, longevity, and value. Life history subjects are discussed under such heads as: Reproduction, weight, age classes, mortality, food habits, denning, range, and populations. Management recommendations relate to maintenance and improvement of habitat, control of damage, establishment of sanctuaries, opossums as competitors, artificial propagation, estimating abundance, and harvesting. The paper has a detailed summary and a list of 57 titles of literature cited. Another of the fortunately growing number of thorough life history studies.

Life Histories: Squirrel, Fox

Baumgartner, Luther L. Fox squirrels in Ohio, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(2), April 1943, pp. 193-202, 1 pl., tables.

Report on a study covering habitats (together with a method of rating their values); daily, seasonal, and dispersal movements; and the character, frequency, and measurements of leaf nests.

Life Histories: Turkey

Mosby, Henry S., and Charles O. Handley. The wild turkey in Virginia: its status, life history, and management. (Commission of Game and Inland Fisheries, Richmond, Va. $1.00 a copy), xx+281 pp., 2 col. pls., 68 figs., 28 tables, 1943.

Wildlife management studies, of fairly recent history in this country, are now certainly paying dividends. Several "best-in-their-class" publications have resulted and this well-made book worthily continues the series. It is the final report on the major research effort of the Virginia Cooperative Wildlife Research Unit from September 1935 to July 1941. In a treatment of the history of the turkey, a map is presented that outlines the approximate original distribution of 6 subspecies. The domestication of the turkey, its utilization by the Indians and early settlers, and its general extirpation also are discussed. Records of disappearance of the bird from 31 counties in Virginia are quoted; however, the species held on in others and was never entirely eradicated from the Old Dominion. The original and present distribution of turkeys in the United States and their range and varying abundance in Virginia are discussed and mapped. Suggestions are made as to further restocking and as to the regulation of hunting in the State. A chapter is devoted to hunting seasons and methods and another to turkey environment as affected by man's activities. Treatment of these subjects occupies Part I of the book, Part II is devoted to life history, and Part III to propagation and management. In the life history section, general characteristics, breeding activities, nesting losses, inimical factors, food habits, roosting, flocking, flying and running, and longevity are treated. Propagation, which was much advanced by Virginia studies, restocking, range requirements, forest management in relation to the turkey, and all phases of a management program for the State receive attention in Part III. An appendix presents considerable data on weights and measurements. There is an 8-page bibliography and a full index. A thoroughly grounded and excellently prepared report.

Life Histories: Upland game birds

Ball, Chester, Norman P. Knott, and Burton Lauckhart. Upland game bird study, Whitman County, Washington, 1940, State Game Commission (515 Smith Tower, Seattle, Wash.), Biological Bulletin 6, iii+81 pp., 7 pls., 3 graphs, 45 tables (mimeographed), Sept. 1941.

The report on field and laboratory investigations of the ring-necked pheasant and the Hungarian partridge contains a description of Whitman County, its flora, and climate, and of two study areas. A section devoted to mating and nesting notes various methods on locating nests and dates of nesting and hatching; pheasants averaged 12.7 eggs per nest and Hungarian partridges 17.4. Hatch was very high, averaging about 95%. More pheasant nests were found in permanent pasture and grassland than in other types of environment, followed by brush, wheat stubble, and alfalfa; while those of the Hungarian partridge were most common in permanent pasture and grassland followed by alfalfa, brush, and wheat stubble. Farming activities were responsible for nesting losses to the extent of 47.4% for the pheasant and 84.7% for the partridge. The study

indicated that only a small percentage of the birds that were unsuccessful in their first attempt at nesting tried again. Losses by predators were small, only three out of four pheasant nests being destroyed and none of those of the partridge. This perhaps is due to a high population of buffer prey. Pheasants were apparently more susceptible to predation than were the Hungarian partridges. The authors state that there were no deaths that could be attributed to parasites and diseases but that more research is needed along these lines. Analyses of crop and gizzard contents for both species of birds are given in tables for all seasons. A large percentage of the food of these birds was made up of waste grains, principally wheat; insects and greens also were important in the birds' diet. During periods when snow covered the ground, thornapple, rose, burdock, teasel, and choke cherry were much utilized by pheasants. There are indications that these birds substitute seeds for grit during the winter months. The food of the partridges under similar conditions consisted mainly of green material, chiefly blades of winter wheat.

The following principal management suggestions are made: Creating small refuges, improving the environment, and reducing the kill. The most critical period for game farm reared birds is the first two weeks after being released in the wild. The fate of such birds is fully discussed and further study is recommended if restocking is to be continued. Bibliography of 8 titles.

Management: Beaver

Tappe, Donald T., The status of beavers in California, California Division of Fish and Game (Ferry Bldg., San Francisco, Calif.), Game Bul. 3, 59 pp., 26 figs., 1942.

There are about 1,300 beavers in California; the number is rapidly reduced when trapping is permitted, but on the other hand, is quickly increased under protection. This paper summarizes the history of beavers, and discusses and maps the distribution of the three subspecies occurring in the State. The location and characteristics of colonies are set forth in detail and habitats and beaver cuttings are freely illustrated. Economic status and ecological requirements are discussed, the history of planted beaver colonies is traced, and management suggestions made. Woody plants are most important as food but cattails and a few other herbs are eaten; of the woody plants, Populus, Salix, and Alnus, in that order, led in value. Bibliography of 12 titles. A comprehensive and valuable paper.

Management: Burning

Cartwright, B. W. Regulated burning as a marsh management technique, Trans. Seventh N. A. Wildlife Conference 1942 (American Wildlife Institute, Investment Bldg., Washington, D. C. $1.00 a copy), pp. 257-263, 1 table.

"Waterfowl nest destruction by fire in April, May, and June is one of the most serious causes of loss in the three Prairie Provinces" of Canada. Origin of the fires and methods of control are discussed. A cooperative campaign to reduce burning on the Libau Marshes was about 75 percent successful and resulted in the best wild duck hatch in 20 years. Management suggestions are made.

Management: Deer

Halloran, Arthur F. Management of deer and cattle on the Aransas National Wildlife Refuge, Texas, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(2), April 1943, pp. 203-216, 1 fig., 3 tables.

The deer herd on the tract involved has had a continuous but eventful history, once being largely depleted by disease. Representatives of various species and subspecies have been introduced but the population retains essentially the characteristics of the native stock. The environment, known changes in it, and census methods used in the present study are described. The food of the deer is rather thoroughly discussed on the basis of field observations; the animals are preponderantly grazers and devote far more attention to species of Paspalum than to other grasses. The paper includes notes on seasonal habits and daily movements and more briefly on life history of the deer. Management suggestions are made with reference to water supply, control of oak brush, distribution and regulation of cattle grazing, and removal of excess deer.

Management: Deer, Mule

Mitchell, G. E. Herd management of mule deer, Trans. Seventh N. A. Wildlife Conference 1942 (American Wildlife Institute, Investment Bldg., Washington, D. C. $1.00 a copy), pp. 391-397, 1 map.

Management should be based on the needs of the individual herd and applied only on the range of that herd. Naming each range after some geographic feature materially aids in locating it. Suggestions are given as to checking on the movements of the animals, determining carrying capacity of the range, estimating populations, and regulating herd numbers. Bibliography of 5 titles.

Management: Duck, Wood

Stuewer, Frederick W. Small entrance to a wood duck nest, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(2), April 1943, p. 236.

This entrance measured 4 x 2-1/2 inches, a size that would exclude even yearling raccoons. The suggestion is made that a small opening about 2 feet above the floor would protect wood ducks using nest boxes.

Management: Elk

Olsen, Orange A. Managing Nebo's wapiti, Trans. Seventh N. A. Wildlife Conference 1942 (American Wildlife Institute, Investment Bldg., Washington, D. C. $1.00 a copy), pp. 375-379.

Abstract of an advance edition of this paper appeared in WILDLIFE REVIEW, No. 35, November 1942, p. 54.

Management: Farm wildlife

Davison, Verne E. Thirty million acres of undiscovered wildlife land in the United States, Trans. Seventh N. A. Wildlife Conference 1942 (American Wildlife Institute, Investment Bldg., Washington, D. C. $1.00 a copy), pp. 366-374, 12 photos.

The author refers to land on farms that can be managed for wildlife. The goal should be limited to practices that are suited to the farm program as influenced by the people who control it. Field borders in wooded country are properly regarded as wildlife land because ordinary farm crops can not be produced at a profit upon them. Similarly the steep sloping banks of streams, rock outcrops and other waste lands, woodland not under forestry management, poorly drained bottomlands, and hedgerows are more profitably devoted to wildlife production than to other uses. Suggestions are given for the management of such lands. Bibliography of 6 titles.

Management: Farm wildlife

Graham, Edward H. War crops from wasted acres, Soil Conservation (Supt. of Documents, Washington, D. C. 10 cents a copy), 8(9), March 1943, pp. 199-204, 4 photos.

The possibilities of increasing wild crops and their utilization are discussed. Among them are farm furs; some fur animals are of value for edible meat and convertible fat. Hedgerows shelter birds and mammals that are of value in feeding upon insect pests of the farm.

Management: Feed patches

Blair, Frank D. Food plantings for game birds, Conservation Volunteer (Minnesota Dept. of Conservation, St. Paul), 6(31), April 1943, pp. 13-15.

Continuous winter feeding is expensive and wasteful, causes the birds to become sluggish, and lowers their resistance and reproductive ability. Emergency feeding may at times be advisable although starvation is not always the cause of winter mortality. In severe cold, the birds' mouths and nostrils become incrusted with snow and ice from the moisture in their exhalations and they die from suffocation. Experiments were made with feed patches as a substitute for artificial feeding and it was found that for Minnesota, cane (a sorghum) was the best grain to use because the stalks always extend above the snow and the seeds adhere tightly to the head. About 5,000 acres of cane has been planted annually since 1935 at a cost less than a fifth of what was previously spent on winter feeding. The effect on the pheasant population has been markedly beneficial.

Management: Forest wildlife

Graham, Samuel A. The integration of fur and timber production, Trans. Seventh N. A. Wildlife Conference 1942 (American Wildlife Institute, Investment Bldg., Washington, D. C. $1.00 a copy), pp. 456-462, 1 table.

The single-crop principle of land management has almost everywhere proved to be fallacious. Diversification is the great need and nowhere more so than in forestry. Woodland products may well be supplemented by those harvested by hunting, fishing, and trapping. Good forest management promotes interspersion of types and favors wildlife production. Trapping should cease to be exploitive and the furs should be handled as a crop. Timber types are rated according to their degree of attractiveness to nine kinds of fur animals, as a contribution toward the integration of fur and timber production.

Management: Fur animals

Butler, L. Fur cycles and conservation, Trans. Seventh N. A. Wildlife Conference 1942 (American Wildlife Institute, Investment Bldg., Washington, D. C. $1.00 a copy), pp. 463-470, 2 figs., 1 table.

From consideration of the cyclic fluctuations in numbers of the lynx and other species, and the effects of trapping upon population levels, the author concludes that there are greater possibilities of production from oscillating than from stable populations, the latter always being comparatively low. Those of some fur bearers have become so low that they are no longer able to respond to better ecological conditions by corresponding increase in numbers. The ideal condition would be one in which just enough breeding stock is left to respond to the changing conditions, but not enough to cause crowding, excessive predation, unnecessary migration, or disease epidemics.

Management: Fur animals

O'Roke, Earl C. Fur bearers--a neglected source of forest revenue, Trans. Seventh N. A. Wildlife Conference 1942 (American Wildlife Institute, Investment Bldg., Washington, D. C. $1.00 a copy), pp. 451-456.

The virgin forests were the source of the great takings of furs in early days, but the slighter growths of the present are probably even more productive. With good management, they certainly can be. Aspen converted into beaver pelts may yield worth-while income from woodland while the owner is waiting for the pines and spruces to grow. Muskrats also, which thrive about lakes and streams in the forest, may be harvested at a profit. Predators probably can be sufficiently controlled by being trapped regularly for furs. The production of furs from forested lands deserves much more attention and management effort than it is receiving.

Management: Herd regulation

Cahalane, Victor H. A conservation spiral, Audubon Magazine (1006 Fifth Ave., New York. 35 cents a copy), 45(1), Jan.-Feb. 1943, pp. 14-18, 3 photos.

Pros and cons relative to regulation of the Yellowstone elk herd. Reduction in numbers and restoration of natural predators are recommended.

Management: Inventory

Davison, Verne E. A calendar system of record keeping for sportsmen, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(2), April 1943, pp. 129-133, 1 fig.

The author suggests that farmers and sportsmen will be in better position to answer questionnaires (as well as to handle their own game problems) if they keep regular records of fish and game taken. He has devised a calendar for the purpose, one page of which is illustrated. Its advantages and uses are pointed out. It may be obtained from the Soil Conservation Service, Spartanburg, South Carolina.

Management: Inventory

Kelker, George Hills. A winter wildlife census in northeastern Wisconsin, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(2), April 1943, pp. 133-141, 1 fig., 2 tables.

The study area on the Nicolet National Forest and the strip method of censusing it are described. Results are tabulated and discussed by species for 3 types of environment. "Animal activity apparently was not influenced by cold spells within the temperature ranges experienced" (0° to 32°). "This type of survey depends upon the ability of technicians to estimate correctly the numerical abundance of several species of animals from signs alone; it gave surprisingly close results for several species. A cost of one-half to three-fourths cent per acre surveyed may be expected with experienced men."

Management: Inventory, age classes of deer

Park, Barry C., and Bosse B. Day. A simplified method for determining the condition of white-tailed deer herds in relation to available forage, U. S. Dept. of Agriculture Technical Bul. 840 (Supt. of Documents, Washington, D. C. 15 cents a copy), 60 pp., 20 figs., 1 map, 22 tables, 1943.

Conditions on the Allegheny National Forest (Pennsylvania) are described and recent history of the deer herd there, its study and management, reviewed. Data on weights and measurements collected 1935-39 are summarized and statistically analyzed. Of all the characteristics studied, that of length of hind foot, on account of its dependability and ease of taking, is recommended for routine use as an index to the condition of a deer herd for which a basic set of weights and measurements by sex and age classes is available. The publication includes 9 titles of "literature cited," and 26 of "bibliography."

Management: Marsh

Hewitt, Oliver. Management of an artificial marsh in southern Ontario for ducks and muskrats, Trans. Seventh N. A. Wildlife Conference 1942 (American Wildlife Institute, Investment Bldg., Washington, D. C. $1.00 a copy), pp. 277-282, 2 tables.

A 1,600-acre farm on which it had been found too difficult and expensive to keep the water down, was converted into a marsh. Pumping was still needed to maintain a constant level. Aquatic plants were introduced and grew rapidly. Trapping of muskrats was begun in a year and has brought an almost annually increasing yield ever since. Range of the figures is: 1930 total catch 575, number per acre 0.48; and for 1942, 8,191 and 7.0, respectively. Some winter feeding has been done. Cattail is a staple food during most of the year but flowering rush (Butomus) is important in early summer. Notes are given on sex ratios and on the values of pelts and meat. The marsh also supports a good population of wild ducks and yields a return from fishes.

Management: Marsh

Smith, Robert H. Management of the salt marshes on the Atlantic Coast of the United States, Trans. Seventh N. A. Wildlife Conference 1942 (American Wildlife Institute, Investment Bldg., Washington, D. C. $1.00 a copy), pp. 272-277.

Subjects included are: control of water levels in relation to maintenance of aquatic plants and to mosquito control; establishment of fresh-water pools in brackish environment; construction of sand dikes to exclude wind-borne sand and salt water; controlled burning; grazing by livestock; planting; cultivation of food crops; and correlation of waterfowl and muskrat management.

Management: Marsh

Ward, Edward. Phragmites management, Trans. Seventh N. A. Wildlife Conference 1942 (American Wildlife Institute, Investment Bldg., Washington, D. C. $1.00 a copy), pp. 294-298.

Sometimes listed as an undesirable marsh plant, the common reed grass, in the opinion of this author, is properly so considered only in times of declining water levels. Muskrats eat the rootstocks to some extent, and small birds seek the insects that live upon the plant, but in general it is not important as a food producer. The interior of unbroken beds is little used by nesting ducks and the plant is aggressive especially in dry years in spreading toward water. Accumulations of growing plants, their debris, and soil about the roots change the ecology of an area occupied by Phragmites--a course that is not easily reversed. The edges of Phragmites beds are very attractive to nesting ducks and as cover the plant not only protects wildlife but also the marsh itself through deterring intrusion by men and cattle. It is an especially valuable refuge for ducks during the summer molt. Reed responds decidedly to changes in water level and may be controlled also by mowing and burning. The writer gives directions for the use of both of these means to attain a variety of ends.

Management: Muskrat

Allan, D. J. Marsh management for fur production, Trans. Seventh N. A. Wildlife Conference 1942 (American Wildlife Institute, Investment Bldg., Washington, D. C. $1.00 a copy), pp. 263-269.

Based on experience in the Canadian Northwest, suggestions are made on maintenance of water levels, control of fire, inventory of stock, regulation of harvest by sections of the marsh, methods and season of trapping, and business procedures. Reference is made to the pike or jackfish as an enemy of young muskrats and of ducklings. Good management of the fur resource offers hope for rehabilitation of the Indians.

Management: Pheasant

Einarsen, Arthur S. Specific results from ring-necked pheasant studies in the Pacific Northwest, Trans. Seventh N. A. Wildlife Conference 1942 (American Wildlife Institute, Investment Bldg., Washington, D. C. $1.00 a copy), pp. 130-138, 2 tables.

On a well-isolated 397-acre island, 2 pheasant cocks and 6 hens were released in 1937; in 1941 pheasants averaged 387 per 100 acres representing a 277 per cent average annual increase for the 5 years. This was in an originally pheasant-free environment and one that was largely immune to human disturbance. Predators caused an average annual loss of about 9 percent. Comparison with a mainland area on which both restocking and shooting were carried on, but on which the pheasant population did not exceed 45.4 per hundred acres, showed that man and his activities were responsible for the difference in results. The author makes management suggestions based on the findings; he especially favors small refuges.

Management: Planting, Mississippi

Batson, F. S. An illustrated guide to identification and landscape uses of Mississippi native shrubs, Mississippi Agr. Expt. Sta. (State College, Miss.) Bul. 369, 61 pp., 60 figs., 1942.

Key to the species, each of which is described and illustrated. Suggestions are made as to landscape use and the plants are classed according to the characteristics of interest in connection with landscaping. The publication includes also an outline map of the soil areas of the State.

Management: Refuges

Gabrielson, Ira N. Wildlife refuges. (The Macmillan Co., 60 Fifth Ave., New York, N. Y. $4.00 a copy), xiii+257 pp., 32 pls., 17 figs., tables, 1943.

There has long been need of an adequate publication on refuges but it has remained for the busy Director of the Fish and Wildlife Service to prepare it. Dr. Gabrielson has enjoyed exceptional opportunities of seeing the wildlife refuges of the United States, Alaska, Canada, and Mexico, and has made the most of them. Indeed he had much to do with the creation and development of many of these sanctuaries. His enthusiasm for the Federal refuge program is evident throughout the work which is a comprehensive and satisfactory guide to knowledge of North American wildlife refuges. The book fully discusses the history of the refuge movement and is "dedicated to those pioneer conservationists whose long and valiant efforts laid the foundation on which the

National Wildlife Refuge system was built." The purposes, values, limitations, and types of refuges are set forth and management practices for the different classes described. Chapters are devoted to Alaskan bird colonies, the fur-seal islands, and to special, big-game, migratory waterfowl, and general wildlife refuges. Okefinokee Swamp and the Patuxent Research Refuge have accounts of their own. Refuges on lands used primarily for other purposes, those administered by other Federal agencies, and State, private, Canadian, and Mexican refuges also receive attention. Tables provide statistical data, maps show the location and spheres of influence of the refuges, and numerous half-tone illustrations embellish the book. There is a 6-1/2-page bibliography and an index.

Management: Seed collection

Sypulski, John L. The Seney bulrush picker, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(2), April 1943, pp. 230-231, 1 fig.

Description and illustration of an implement on the plan of a blueberry rake for gathering seeds of bulrushes.

Management: Seed treatment

Afanasiev, M. Propagation of trees and shrubs by seed, Oklahoma Agr. Expt. Sta. (Stillwater), Circ. C-106, 43 pp., 8 pls., 1942.

Three methods of treating seed so that they will germinate more readily are described, namely, by means of sulphuric acid, hot or boiling water, and mechanical scarification. Suggestions on planting are made and accounts are given of the seeds and their gathering and treatment to overcome dormancy for fruit and nutbearing woody plants, both cultivated and native. References to related publications abound and the seeds are mostly well illustrated photographically.

Management: Stocking

Clark, Arthur L. Annual restocking--game management or public relations?, Trans. Seventh N. A. Wildlife Conference 1942 (American Wildlife Institute, Investment Bldg., Washington, D. C. $1.00 a copy), pp. 179-184.

By questionary the author learned that 32 states spent in one year $1,270,745 for the propagation or purchase and distribution of game (chiefly upland game birds). No reliable measurements are available as to the results accomplished. The author believes that a determined effort should be made to get such information.

Management: Stocking

Taylor, D. J. Game management in Ontario, Trans. Seventh N. A. Wildlife Conference 1942 (American Wildlife Institute, Investment Bldg., Washington, D. C. $1.00 a copy), pp. 361-365.

A small number of European hares released about 1915 increased so that now they are the most hunted small game animal. They have occupied practically all of southern and southwestern Ontario. Pheasants, although thoroughly tried, have been established only sparsely except on Pelee Island. There they increased so as to become objectionably destructive to crops. Organized hunts have reduced this trouble and brought considerable incidental income to farmers, with whom the birds and the hunters are now popular.

Management: Stocking, bobwhite

Frye, O. Earle, Jr. The comparative survival of wild and pen-reared bob-white in the field, Trans. Seventh N. A. Wildlife Conference 1942 (American Wildlife Institute, Investment Bldg., Washington, D. C. $1.00 a copy), pp. 168-175, 2 tables.

The study area in northeastern peninsular Florida and the methods followed are described. Banded pen-reared and wild-trapped birds were captured in equal numbers at intervals and despite indications on the part of the pen-reared bobwhites of lesser ability to take care of themselves, the percentages of survival in the two groups were about the same. The results and their bearing upon management are discussed.

Management: Stocking, grouse, sharp-tailed

Douglass, Donald W. Sharptail stocking progress, Michigan Conservation (Michigan Dept. of Conservation, Lansing), 12(3), April 1943, pp. 8-9, 2 maps.

This "account deals with the sharptail's former and present range in North America, its Michigan status, and the efforts x x x to accelerate the spread of the species by transplanting wild-trapped birds." Stock has been transplanted from other areas in Michigan, and from Wisconsin and Alberta. Life history notes are included.

Management: Transplanting beavers

Spriggs, James W. Rehabilitating the beaver, Wyoming Wild Life (Wyoming Game and Fish Commission, Cheyenne), 8(2), Feb. 1943, pp. 1-5, 15-17, 3 photos.

Trapping of beavers in over-populated areas and transplanting them in other localities has been undertaken by the Wyoming Game and Fish Department. Trapping methods are described as are also several types of sets, namely, channel, forage, dam, house, scent, heap, and artificial scent. Care and skill are required in properly setting traps for best results as the animals become very cautious and difficult to capture after one experience with a trap. Instructions are given on the handling and transportation of beavers. "Selected future habitat should be surveyed carefully in advance of liberation, to determine the most favorable sites for planting. Main requirements for a satisfactory beaver habitat are (1) a year-round supply of running water of sufficient volume, (2) food of sufficient supply and variety, (3) satisfactory gradient and elevation, (4) protection from poachers." "Beaver should not be planted in a new area in numbers less than two pairs; lots of three or four pairs are preferred."

Management: Transplanting waterfowl

Williams, C. S., and E. R. Kolmbach. Migration and fate of transported juvenile waterfowl, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(2), April 1943, pp. 163-169, 1 table.

An account of the strong attachment of adult waterfowl to nesting areas, migrating paths, and wintering grounds to which they "home" whenever possible, transplanting them, unpinioned, generally results in failure. The authors, therefore, experimented with the stocking of young birds in which the homing tendency supposedly might not yet be strongly developed. Four long-distance shipments of Canada geese (involving 131 birds) and 7 with wild ducks (totaling 213 individuals) were made. Returns of banded specimens indicated no urge to return to the natal home. From a management standpoint, the results pointed to practicability of the method for restocking the geese but not the ducks. Modification in method might alter this conclusion. Previous work on bird transplanting is reviewed, 14 publications being cited.

Natural History: Amphibians of Colorado

Redeck, Hugo. Guide to the Amphibia of Colorado, Univ. of Colorado Museum Leaflet 2 (Boulder, Colo. 15 cents a copy), 8 pp., 5 figs., March 1943.

Key to 14 species; descriptive notes, and statements of range.

Natural History: Herpetology of Arizona

Kauffeld, Carl F. Field notes on some Arizona reptiles and amphibians, American Midland Naturalist (Notre Dame, Indiana. $1.00 a copy), 29(2), March 1943, pp. 342-359, 2 pls., 2 figs.

Deals with 9 species of amphibians and 31 of reptiles. Bibliography of 26 titles.

Natural History: Mammals

Hamilton, Wm. J., Jr. The mammals of eastern United States. (Comstock Publishing Co., Ithaca, N. Y. $4.00 a copy), [2] + 432 pp., frontis. + 184 figs., 1943.

Contains "brief descriptions and accounts of the distribution and habits of all the present day land mammals naturally inhabiting the States east of the Mississippi River." Keys to the orders and genera are provided. The book is well illustrated with 30 mammal portraits by Earl T. Poole, and with numerous new photographs. The ranges of every subspecies are given on maps of sufficient size so as to be unmistakably clear. The maps and other illustrative material are outstanding in a book distinguished for excellent typography and composition. The writer has had extensive experience with the mammals of the region. His treatment of species and subspecies is thorough; his description of habits semi-popular and interestingly written. The book is an excellent compilation on the mammals of an important region.--Victor H. Cahalane.

Natural History: Mammals of the national parks

Cahalane, Victor H. Meeting the mammals. (Macmillan Co., 60 Fifth Ave., New York, N. Y. $1.75 a copy), ix+133 pp., 52 drawings by Walter A. Weber, 1 map, tables, 1943.

Entertaining accounts of numerous kinds of mammals that can be observed in national parks and monuments, with suggestions on where to see them and how to study them. Park policies toward wildlife are quoted and the treatment of predators and beggar animals discussed. Tables list the principal mammals and designate the best places for observing them for 30 western parks and monuments, the locations of which are shown on a map inside the front cover. A reading list of 38 titles is presented.

Natural History: Salamanders of West Virginia

Green, N. Bayard. The salamanders of West Virginia, West Virginia Conservation (Conservation Commission, Charleston, W. Va.), 7(2), May 1943, pp. 12-13, 18-19.

Description and distributional notes on 25 species.

Natural History: Snakes of California

Kessel, Edward L. The snakes of California, Wasmann Collector (University of San Francisco, Calif.), 3(1), Nov. 1938, pp. 19-24.

Check-list of 56 species and subspecies.

Natural History: Trees

Harlow, Wm. H. Trees of the eastern United States and Canada: their woodcraft and wildlife uses, (Whittesley House, 330 West 42nd St., New York, N. Y. $2.50 a copy), xiii + 288 pp., 5 col. pls., 152 figs., 1942.

Characters used in the keys are discussed and illustrated and keys are given to the genera and species of trees. The text briefly describes appearance, leaves, flowers, fruits, and bark; notes the habitat and range; and includes remarks upon the value, uses, and other matters of interest. The items mentioned in the subtitle are rather sparsely treated.

Propagation: Duck, Eider

Rolnik, Vera. Instructions for the incubation of eider duck eggs, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(2), April 1943, pp. 155-162, 1 fig.

Account of some of the methods used at the Seven Island Reservation, Barents Sea, U.S.S.R. for the conservation of eiders and increase in down production. The author discusses gathering and transporting the eggs, artificially incubating them, and hatching and caring for the ducklings. The indications are that the eider duck can be domesticated.

Propagation: Pheasants

Taylor, Lawrence N. A reference table, Modern Game Breeding (J. A. Gardy Printing Co., 28 W. State St., Doylestown, Pa. 25 cents a copy), 13(4), April 1943, folder, pages not numbered.

Preliminary tabulation of information on natural range, abundance there, comparative numbers in captivity, age when adult plumage is attained, age when breeding begins, number of hens advisable to mate with a cock, laying season, number of eggs per clutch and per year, and incubation period, for 63 species of the family Phasianidae.

Research: Age determination in Galliformes

Petrides, George A. Age determination in American gallinaceous game birds, Trans. Seventh N. A. Wildlife Conference 1942 (American Wildlife Institute, Investment Bldg., Washington, D. C. $1.00 a copy), pp. 308-328, 4 figs., 1 table.

Review of literature of which 20 titles are cited, and report upon the status of characters used (shape of primaries, rectrices, color of wing coverts, etc.) in the various groups of American gallinaceous birds. There is briefer mention also of certain foreign species.

Research: Hair identification

Brown, F. Martin. The microscopy of mammalian hair for anthropologists, Proc. American Philosophical Society (104 S. Fifth St., Philadelphia, Pa.), 85(3), Feb. 1942, pp. 250-274, 127 figs.

Notes on the author's technic of hair study and on the characters by which hairs may be differentiated. Tables summarize hair and hair scale measurements, and pigmental characteristics of both guard and fur hairs of the genera of nearctic Carnivora. Keys for the separation of these fibers also are given and the hairs are described in further detail for both family and generic groups. The paper is amply illustrated. No mention is made of recent American work on this subject as by Hardy, Mathiak, Plitt, and Williams.

Research: Marking mammals

Cook, Arthur H. A technique for marking mammals, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 24(1), Feb. 1943, pp. 45-47, 2 figs.

Review of 4 methods that have been proposed and citation of the publications involved. The author's suggestion is a metal tag inserted around the Achilles' tendon and riveted.

Research: Marking mammals

Fitzwater, William D., Jr. Color marking of mammals, with special reference to squirrels, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(2), April 1943, pp. 190-192, 2 figs.

Description and illustration of restraining devices to hold squirrels or other small mammals while their fur is being marked with a dye, Pyranzol A, address of the manufacturer of which is given. Suggestions are made of a system of marking that will serve to identify 31 individuals. Bibliography of 5 titles.

Research: Reference collection of seeds

Griner, Lynn A. Classifying and storing a reference collection of seeds, Journ. Wildlife Management (Logan J. Bennett, 206 Forestry Bldg., State College, Pa. $1.00 a copy), 7(2), April 1943, p. 229, 1 pl.

Description of an arrangement that was in part a key to identification and of a rack (also illustration of this) for holding the vials of seeds.

Research: Rut determination in deer

Cheatum, E. L., and Glenn H. Morton. Techniques used in determining the period of the rut among white-tailed deer of New York State, Trans. N. A. Wildlife Conference 1942 (American Wildlife Institute, Investment Bldg., Washington, D. C. $1.00 a copy), pp. 334-342, 4 figs.

Description of a method involving measurement of the volume of testes, examination of ovaries and embryos from females killed during the hunting season, and inspection through Caesarian sections of females bred in captivity. The results achieved are noted but the work was not completed. Bibliography of 5 titles.

Research: Sex and age determination in Anatidae

Hochbaum, H. Albert. Sex and age determination of waterfowl by cloacal examination, Trans. Seventh N. A. Wildlife Conference 1942 (American Wildlife Institute, Investment Bldg., Washington, D. C. $1.00 a copy), pp. 299-307, 1 fig.

Dissection is necessary to ascertain the sex of many birds but in ducks, geese, and swans of any age, sex can be determined by cloacal examination revealing the presence or absence of a penis. Immature birds can similarly be detected by the opening into the bursa of Fabricius. Characters of the penis and oviduct also are of use in ascertaining age. Use of the methods is recounted and figures are given of the structures involved.

Weights: Cottontail

Denny, Arthur H. Check your soil for rabbits, Missouri Conservationist (Missouri Conservation Commission, Jefferson City), 4(2), May 1943, pp. 12, 16, 1 photo (portrait of Paul D. Dalke), 1 table.

Tabulation and discussion of data showing that the average weights of rabbits (2.1-2.8 lbs.) tend to vary directly with fertility of the soil of their habitats. Conclusions: "(1) The poorest land not only has the smallest rabbits, but also fewer than other areas of the state. In fact, rabbits were

so scarce that no specimens were obtained from two Ozark areas; (2) rabbits are found to be most abundant on soils of medium fertility. It is on these soils that the commercial rabbit industry has been developed in Missouri and, as has been noted by Rowe and other investigators, the rabbit population remains high year after year in spite of the annual removal of large numbers of cottontails; (3) the richest soils produce the largest rabbits, but because the soils are rich they are intensively cultivated and the amount of cover available to rabbits is inadequate to maintain a large population. The density of red fox on these good soils is another factor limiting rabbit populations."

Weights: Lark, Horned

Beilde, Wm. H. Weights of some western subspecies of horned larks, Auk (J. Fletcher Street, 1120 Locust St., Philadelphia, Pa. $1.00 a copy), 60(2), April 1943, pp. 216-221, 5 tables.

Records and discussions of weights of larks of several subspecies.

Weights: Larks, Horned

Montagna, Wm. Weights and plumages of the horned larks of central New York, Auk (J. Fletcher Street, 1120 Locust St., Philadelphia, Pa. $1.00 a copy), 60(2), April 1943, pp. 210-215, 1 table.

Weights recorded for numerous specimens of the northern and the prairie horned larks, the former distinctly heavier. Most of the specimens taken near Ithaca, N. Y. Bibliography of 7 titles.

Weights: Whales

Quiring, Daniel P. Weight data on five whales, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 24(1), Feb. 1943, pp. 39-45, 3 tables.

The 5 specimens included 3 humpback, 1 sperm, and 1 finback, whales. Weights of different organs and totals approximated from piecemeal weighings at a flensing station in California. Total weights ranged from 82, to 131, thousand pounds.

ADDENDUM

Diseases and Parasites: Coccidiosis

Honess, Ralph F. Sage grouse coccidiosis not transmissible to chickens, Poultry Sci. (Poultry Science Association, Menasha, Wisc. 75 cents a copy), 21(6), Nov. 1942, p. 560.

Outbreak of coccidiosis occurred in 1932 in Fremont County, Wyoming, sage grouse, Centrocercus urophasianus, on ranch where birds intermingled freely with chickens. Subsequently, outbreaks occurred in this and other Wyoming localities. Viable oocysts from diseased grouse were fed to 2 breeds of chickens over a 3-year period, but not one out of 49 experimental birds developed a case of coccidiosis. Author concludes that this disease is not transmitted from

grouse to chickens, and considers it probable that grouse are not infected by contact with domestic fowls.--Lee E. Yeager.

WILDLIFE LEAFLETS

Issues of interest to wildlife managers additional to those previously mentioned are listed below. Copies of these mimeographed leaflets can be obtained from the Fish and Wildlife Service, U. S. Department of the Interior, Chicago, Ill.

232. Annual fur catch of the United States, 22 pp., February 1943.

Statistics from the 39 States and Alaska, whose license systemsand records enabled them to furnish the desired figures, which in most cases are given by species and for each of several recent years. Not summarized. Introductory remarks relate to importance of the fur trade and the need of improved regulation of it.

233. Poisonous snakes of the United States, 17 pp., March 1943.

Key to the principal poisonous species and statement of their ranges. Description of the poisonous apparatus and of the venom. Mortality resulting from snake bite; proper treatment. Miscellaneous facts about poisonous snakes, including their food habits, and bibliography. Supersedes Leaflet BS-70, 1936.

234. Directions for destroying house mice, 3 pp., February 1943.

Suggestions as to trapping and poisoning. Discussion of the cat as a mouser, and directions for repelling mice.

235. Birdbanding, by Frederick C. Lincoln, 5 pp., March 1943.

Leaflet introductory to cooperation in this work, dealing with its history, authorization and direction, qualifications of participants, safeguards against injury of birds, description of bands, and statement of the value of the work. Supersedes Wildlife Leaflet 145, 1939.

236. Protecting victory gardens from animal pests, 6 pp., 2 figs., April 1943.

Directions for trapping rabbits; also suggestions for the control of moles, pocket gophers, field mice, ground squirrels, woodchucks, rats, and birds.

237. Control of woodchucks, 4 pp., April 1943.

Recommendations for gassing mostly applicable to eastern,and for poisoning to western, woodchucks.

NOTES AND NEWS

The Missouri Conservation Commission (Jefferson City) has published in handy printed form information, issued elsewhere in less attractive and permanent guise, on how to make intelligent use of wildlife resources during the war period. The leaflets cited are Informational Circulars, No. 1 on "Waterfowl feathers"; No. 2, "Fats from furbearers and other wild animals"; and No. 3, "Rabbit fur essential to war effort". They detail the emergency values of these products and instruct hunters in collecting, preserving, and disposing of them. Circular No. 4 discusses "Wildlife--a renewable food resource if used wisely," relating to better utilization of familiar game and increased use of other species, includes recipes for cooking the flesh of some of the less popular mammals and fishes.

The January 1943 issue of The American Biology Teacher (Vol. 5, No. 4, P. K. Houdek, Robinson, Ill.) is occupied largely by the following articles on the teaching of conservation:

Lumley, Ellsworth D. Teaching conservation in biology (pp. 75-76). The biology class is the best place to teach conservation and the teaching should be directed toward raising standards.

Sprecher, Stanley. Conservation education and the biology teacher (pp. 77-79). Chiefly a report on the returns from a questionary to state departments of education on the present status and desirable modifications of conservation instruction.

Eyestone, B. L. Pupil activities in teaching conservation (pp. 79-82, 4 figs.). Suggestions as to practical activities for a learning by doing program. Includes suggestions on game-bird feeders and bird houses.

Ludden, A. J. A project in conservation (pp. 82-83). Preparation of models to illustrate conservation projects.

Collins, Willis W. Conservation as a production policy (p. 84).

Palmer, E. Laurence. The war hits succotash biology (pp. 86-90, figs.). There should be more teaching on how to care for oneself out of doors; suggestions.

Bryan, Arthur H. Conservation (pp. 90-92). Contrasts exploitation and ordered use. Sketches recent advances particularly in refuge establishment.

Restrictions on travel and other conditions incident to the war have made it necessary to terminate the activities of the Cooperative Quail Study Association. This organization, successor to that which investigated and supported the Cooperative Quail Investigation (1924-29), under the leadership of Herbert L. Stoddard, assisted in later years by E. V. Komarek, has kept well-

informed wildlife management alive in the Southeastern States, and its dissolution is greatly to be regretted.

A book by 23 specialists on "Relapsing Fever" that discusses tick vectors, epidemiology, and other aspects of the disease may be obtained from the American Association for the Advancement of Science, Smithsonian Institution, Washington, D. C. (viii + 150 pp., illus., 1942. $3.00 per copy.)

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